# TRAFFIC QUARTERLY

AN INDEPENDENT JOURNAL FOR BETTER TRAFFIC

JULY 1952

Drivers' IQ
Swiss Traffic Problems
Unified Parking Facilities
Financial Responsibility Laws
A Year of Virginia's Pilot Study
Mechanical Brain Aids Traffic Courts
Pedestrian Protection in Portland
Women Guard School Crossings
Scientific Toll Collection
Balancing Road Needs
Impounding Cars

THE ENO FOUNDATION FOR HIGHWAY TRAFFIC CONTROL

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# Traffic Quarterly

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# Driver I.Q.

A legal driver is one who has obtained an operator's permit. He is legally presumed to be competent to drive.

That is an unwarranted presumption. Present law bases a driver's legal competence on two tests: an examination to determine the applicant's mechanical ability to operate a car, the other a question-and-answer procedure that is far from uniform or realistic.

Once the driver receives his permit, he proceeds to drive, fully aware that he doesn't know how but happy with the knowledge that he has been told he does and has a legal document to that effect.

Intelligence is the mental capacity of meeting a situation, especially a new or unusual one, by proper behavior adjustment.

Put another way, it is the mental ability to recognize the interrelationships of presented facts or situations in such a way as to guide action toward a safe or desired goal.

These are high-sounding but simple, essential and necessary qualifications of a sane, safe driver.

They constitute the driver's I. Q.

Unfortunately, our driver-qualification tests, judged by their ineffectiveness, are feeble and inadequate.

They contribute little to the determination of mental capacity or the seriousness of driving responsibility. They are far from suitable to meet present-day driving requirements.

They are the causative source of our present predicament.

What gain can we expect toward a solution of our problem if under our present methods we continue to qualify incompetents faster than we can remove them from the highways?

The most casual observer daily will encounter a sane intelligent driver, a reputable citizen, destined on an important business errand, uselessly and dangerously violating simple regulations of the road, essential to safe driving.

Though well aware of its truth, the reputable driver would violently resent the accusation.

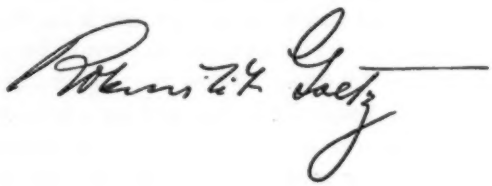
He is a representative citizen, highly esteemed in his community. His driving attitude, by commission of such faults, plainly indicates

a serious lack of responsibility. He is wholly without concern or respect for the road rights of others and psychologically unfit to drive.

He is John Doe, an average or better than average citizen.

Therein lies the guilt of the public and its contribution to the bad driving and the high traffic death rate.

The public has a low Driving I. Q.



# New York Uses a Mechanical Brain to Aid Traffic Court Problems

JOHN M. MURTAGH

*Mr. Murtagh is Chief City Magistrate of the City of New York. Previously he was Assistant Attorney General of the State of New York in the Kings County Bribery Investigation in 1938–40 and was in charge of the Queens County Paving Investigation in 1940–41. Later he was Special Assistant to the Attorney General of the United States. From 1946 to 1950 when he became Chief City Magistrate Mr. Murtagh served as Commissioner of Investigation of the City of New York.*

WHEN young Arnold Schuster, who had recognized Willie Sutton in a subway train, was killed on a Brooklyn street one Saturday evening last March, someone reported the presence in that area of a car with Pennsylvania plates. The only lead was the fact that the last two numbers were 90.

Within a few minutes we were able to furnish to the New York police the full license numbers ending in 90 with description and owners' names and addresses of a dozen Pennsylvania cars involved in summonses returnable in New York City's Traffic Courts. Immediate investigation was started by police authorities in a dozen communities in Pennsylvania to determine the activities of the holders of those license plates on the night of the murder.

In a recent article dealing with the New York City Traffic Courts, the *New York Daily News* announced that we were looking for a mysterious young man who, at that moment, was probably driving "right through most of the City's traffic laws," a 1950 Cadillac sedan with Connecticut license plates. Attention was called to the fact that this particular New Yorker had the habit of parking his Cadillac in restricted areas, in fire hydrant zones and at bus stops; that he had a habit of speeding, making illegal U-turns and passing red lights; that he had ignored 27 traffic summonses issued against him in the previous year and a half; that at various times he had

given his occupation as longshoreman's union delegate, mechanic, and artists' representative.

With considerable detail the facts set forth the various areas of the city in which this man might be located and the hours during which he might be found there. It was mentioned that the Connecticut Motor Vehicle Bureau was waiting for him to apply for renewal of license plates, and that the New York Motor Vehicle Bureau was on the alert for the time when he would come in to renew his license to drive. No name was given, no address was listed in the newspaper article. Yet, the very next morning this multiple offender, who had ignored many notices to appear in court, walked into my office and said—as if he didn't know—"I hear you're looking for me. I've come in to plead guilty to all the charges against me."

Up to two years ago it would have been impossible for us to compile anything like this amount of information about this or any other offender except by personal questioning. But today, in a few minutes, judges in our Traffic Courts can be supplied with a complete dossier of this type on any multiple offender. This has proved a potent weapon against the law-violator who tends to scoff at or to ignore the summonses to appear in Traffic Court.

Every six seconds a traffic violation is committed in New York City. Every thirty seconds a summons is issued for one of these violations. Our Traffic Courts, located in each of the five boroughs of the City, dispensed justice in 1,000,000 cases last year, as against 350,000 in 1945. The steady increase in numbers of cases, year by year, has brought with it a corresponding annual increase in the amounts of money collected through Traffic Court fines. In 1951 this sum reached an all-time high, with the collection of $5,421,747 in fines.

This represents twice the sum required for the operation of our entire Magistrates' Courts system, which in its fifty-three parts handles many of this great city's social and psychiatric problems involving vice, gambling, alcoholism, drug addiction, sex perversion, domestic strife, maladjusted adolescence, public safety and preservation of law and order generally. The vigilant enforcement of traffic laws and regulations in New York City has made is possible to

lift the entire cost of this large, important system of courts from the shoulders of the conscientious taxpayer and to place it on the shoulders of the law-violator. In addition, during 1951, the city's General Fund was increased from this source by a net income of more than three and a half million dollars.

What is even more important—because it translates itself into terms of greater road safety and consequently must reflect itself in fewer tragedies on the city's streets—is the fact that, through modern systems of control, we are now able to keep pace with the yearly increase in traffic volume in New York City. And these controls have highlighted, clearly and unmistakably, the responsibility of each citizen for his observance of the rules of the road and his respect for the authority of the law enforcement agencies of this metropolis.

## The Traffic Court "Fix"

No single factor in the history of the twentieth century has had a greater demoralizing effect upon the life of local communities than the feeling, quite prevalent in our own city a couple of decades ago, that traffic offenses were trivial and that the holder of a traffic summons need never worry so long as he could "contact" someone with the right connections to put in the "fix." When the integrity and impartiality of law-enforcement agencies become doubtful, the average citizen becomes contemptuous of his government, his laws, his police department and his courts. The ramifications of this attitude are far-reaching and significant.

The *New York Times* reported last January 6th, for example, that considerable concern had been expressed in Massachusetts over the fact that the Commonwealth's much-heralded system of compulsory automobile insurance was failing "because of the comparative ease with which traffic violations can be fixed through political influence at the community level." The driver who knows he "has nothing to worry about" is bound to become careless and take unnecessary chances. The Fourth Annual Report of the National Committee on Alcohol Hygiene, Inc., released in Baltimore, Maryland last March 15th under the title of "Delinquency in

America," cited as an important contributing factor toward delinquency of youth the parental attitude toward traffic laws and the fixing of traffic tickets.

The battle against the fixing of traffic tickets in New York City has been a long and arduous one. Though it took years of persistent planning and patient plodding to accomplish this result, I am certain that most of New York's eight million today fully appreciate the insidious influence of the "fix" upon a community's morals.

Much has been done in the last two decades to reduce the rate of accidents and fatalities in New York City. In 1925, for instance, with less than half a million vehicles registered here, there were 1100 vehicular deaths; in 1929, with 737,062 vehicles registered, the number of fatalities rose to 1332; then came a steady downward trend so that in 1951, with almost *twice as many* registrations (1,412,722) over the 1929 figure, the fatalities were *less than half* (559). The toll is still much too high, and we are constantly devoting ourselves—in close cooperation with all the other agencies concerned with traffic safety—to the effort to reduce these figures much further.

But the fact that the death rate has been so materially reduced over the years indicates what proper concentration upon this problem can achieve. One factor in reducing accidents unquestionably has been the construction of parkways and express highways to take traffic off the city's streets. Safety programs and intelligent policing have had their part, too, in effecting these results. But over and above those factors, I cannot help feeling that many of the 30,853 persons who lost their lives in New York City between September 13, 1899 —when the first New Yorker stepped into the path of an automobile as he alighted from a trolley car at Columbus Avenue and 74th Street—and the end of 1951, might still be with us today if our drivers had shown greater respect during the early years of the century for the rules and regulations pertaining to traffic safety. Without doubt the same holds true for many of the one million men, women and children throughout the country who have sacrificed their lives to the motor vehicle.

Our present system of control has increased our effectiveness in dealing with the irresponsible driver. The fact that we can now track down characters like the Cadillac cowboy and others of his

type has done much to raise the prestige of and increase respect for Traffic Court. And this same system has made it possible for us to give instant service to the police and to the Federal Bureau of Investigation in many cases involving known criminals and criminal suspects where the original clue consisted of fragmentary information such as that available in the case of the Pennsylvania car in the vicinity of the Schuster killing.

### Keeping Pace with the Automobile

In 1945 Judge Edgar Bromberger, who had served in various state and city capacities over a long period of years, and as a City Magistrate had come into contact with difficult and complex problems involved in Traffic Court operations, was appointed Chief City Magistrate by the late Mayor Fiorello H. La Guardia. With extraordinary zeal, based upon personal experience and a sincere desire to strengthen and improve the preventive phases of the Court's operations, he instituted a series of studies aimed at effectively improving the Court's services. Judge Bromberger recognized new problems caused by the great increase in automobile traffic and foresaw that these problems would be intensified by the lifting of wartime controls upon the manufacture of cars. As soon as he took office he began to reorganize and revitalize the Traffic Courts, concentrating his efforts toward eliminating the horse-and-buggy methods then in existence.

During Judge Bromberger's tenure I was serving as New York City's Commissioner of Investigation, and he called upon me from time to time for advice and assistance in his study of these Courts. Minor irregularities and inefficiencies were found in various aspects of the Court's operations, but because of their very pettiness and the lack of proper tools and controls to ferret them out they were difficult to detect. A minute analysis of these Courts was conducted by Judge Bromberger and his staff during the entire five years of his incumbency. The enforcement procedures were found wanting, and it soon became obvious that without modern business techniques Traffic Court operations would soon get out of hand and the integrity of that Court would inevitably suffer.

Once he had established the nature of the problem, Judge Bromberger set about to convince the city authorities of the urgent need for a completely new business machine system to supplement and, in a large measure, replace the antiquated system of recording fines in docket books. He obtained the necessary authority and appropriations to rent specially-designed machines from the International Business Machines Corporation—the first tangible step in the organization of our present system. Because of unavoidable delays involved in the conversion of the system of operation and control, it was not until January 1950, one month before Judge Bromberger retired from office, that this new machinery was placed into operation and the Traffic Summons Control Bureau was organized to assume overall responsibility for the traffic enforcement program in the City Magistrates' Courts.

Because of my participation in certain phases of Judge Bromberger's studies, I was in the fortunate position, when I assumed this office in February 1950, of being forearmed with some knowledge of the problems and realization of the defects in the old system.

## The No-Fix Judge

One inescapable fact that realistic court administrators must bear constantly in mind, and which Judge Bromberger and I have tried to keep ever before us in establishing Traffic Court controls, is that a no-fix system, whether it apply to traffic courts or to any other category of judicial activity, will work only so long as one can rely upon the integrity of the court's personnel. The only positive guarantee of the effectiveness of a no-fix ticket is the appointment of a no-fix judge.

A system of control can be letter-perfect. Still, if the judge and his aides insist upon being "good guys" and close their eyes to particular situations because the "right" person is interested, corruption must result. It is with great pride that I can say that in New York City today with the safeguards provided by the business machine system and the high calibre of conscientious judges in our Traffic Courts, we have pretty nearly the perfect setup for no-fix tickets and no-fix judges.

### The Weakest of the Finest

Though this human element is the basic factor in any system of control, we have found that the mechanization of our traffic control system has made it possible to reduce even the human factor to a point where it can be properly policed. Soon after I took office, for example, I became aware of the problems created by the existence of a staff of 50-odd police officers assigned to our Traffic Courts for the purpose of bringing before the Magistrates, through invitation or arrest, the recalcitrant offenders who failed to answer court summonses. These 50-odd, who fortunately are not representative of New York's Finest, were not subject to the control of the Court but were responsible only to their Commissioner. Yet the judges had to rely on them to bring offenders to justice. There were rumors and suspicions of misconduct on their part, and of the fact that it was possible for an offender to have his paper "buried" if he knew how to talk to a warrant officer.

Judge Bromberger had urged that they be replaced by employees subject to the control of the Court, but when I took office they were still there. It didn't take me long to realize that we would be much better off without them. When finally they were transferred out, many "dead" cases suddenly came to life. Complete control over Traffic Court was then made possible, and it soon became apparent that with the new system in operation there would be no need for replacing the warrant officers. Thus greater control was attained at an annual saving of more than a quarter of a million dollars in salaries.

As soon as this important step was accomplished, I learned that some motorists with "influence" had found it possible to head off their tickets *before* they reached Traffic Court. Here again, only a small unrepresentative contingent of our police force was involved. With the issuance of each summons, two stubs were detached from it, one to be affixed to the court papers and the other to remain in the stub book in the police precinct. When an error was made in issuing a summons, it could be corrected by marking the stubs "void," having no court papers prepared and permitting the motorist to tear up the summons. I found that some of the "errors" were spurious

and so informed the Police Commissioner. He thereupon issued an order directing that summonses were not to be voided for *any* reason. I then let it be known in police channels that the Court, through the use of the IBM machinery, had a ready check on compliance with the order inasmuch as summonses are marked with consecutive numbers. Periodic checks are now made to determine whether all summonses are returned to the Court. Our studies show that this channel, too, has been completely closed off.

Still a very few persistent police officers kept matching wits with our machines. These few tried to insure their personal popularity by "killing" tickets before they reached the Court. Inquiry indicated that the new method was to alter a digit or two in the license appearing on the stub. Once more, using the IBM machinery, a few score such apparent instances were found and reported to the Police Commissioner. Charges were filed against the responsible officers and this method, too, became history.

### Trying to Outsmart the Mechanical Brain

Every bit of data that any enforcement officer could possibly wish to have on each of the 1,000,000 annual violators is now readily obtainable within a matter of minutes through a phone call to our Traffic Summons Control Bureau. The machines compile and correlate data on repeaters according to any desired category, and trace the pattern of the offender's driving and personal habits with such detail as to reduce the problem of detection to a minimum. Not only is it possible to trace the course of the habitual offender as he drives and stops on mile after mile of New York City streets, but we also trace as a routine matter the course of the summons through the stationhouse, through the police division which gathers up the records from the various precincts, and through the Courts up to the moment when the fine is paid and a receipt is issued to the offender.

When, recently, a political leader on the municipal payroll brought in a letter on official stationery attesting to the fact that he was on City business at the various times when he received parking summonses, it took a few minutes and the pushing of one or two

buttons to prove that on all of the occasions in question his car was in front of his home or in the vicinity of his clubhouse. It goes without saying that he finally came in personally and paid all the outstanding fines in full.

A neglectful union leader, after many delays, was finally induced to appear before me and was ordered to pay $744 in fines, with the alternative of 131 days in jail, on a number of parking offenses. He sent for a friend to pay his fine. His friend was recognized by a member of my staff as an old customer of the Court. Just to make sure of *his* standing before the Court, the sorting machines were put into operation. Sure enough, within a few minutes the friend had himself been assessed for ten violations outstanding against him.

When a Canadian citizen violated the parking regulations thirty-nine times with a car equipped with Ohio plates and once under Canadian plates, the IBM machines made it possible to compile all the data against him. He ended up by paying $975 in fines.

A certain well-known tennis pro amassed forty violations with the use of license plates from a southern state before he was stopped for making a turn against a light. A police officer's suspicions caused a quick investigation by the Traffic Summons Control Bureau. The outstanding summonses were found and he was compelled to pay $625 in fines which previously could not have been collected.

These incidents taken at random are indicative of the controls made possible by this new system. They could be told many times over with slightly different sets of circumstances but the pattern is a consistent one. Their principal value is not so much in the money brought in that would not otherwise have been collectible, but more than that—and I cannot stress this point too strongly—in the value they have in establishing respect for our traffic laws and our traffic enforcement procedures. This increased respect for law and order will in the long run mean greater safety for all who use our streets, and will reduce the tragedy and heartache that follow in the trial of the careless and irresponsible motorist. Under the old system, compiling most of this information would have been cumbersome and time-consuming, and many of these offenses would have been checked off as unenforceable. The present system compels attention

to these situations to the point that many a would-be evader, conscious of his inability to outsmart a highly competent mechanical brain, surrenders before the battle begins.

Seventy per cent of the summonses returnable in Traffic Courts in New York City are for violation of parking regulations. Judge Bromberger, again preparing for a large increase in volume, made it possible for first offenders to pay such summonses by mail. As the volume increased still further, I extended this regulation in March, 1950 to allow *all* parking violators, regardless of previous offenses, to pay their fines by mail. One who is tardy in answering such a summons must appear in person before the Magistrate, and one who wishes to make an explanation in mitigation of his offense, in the hope that his fine may be reduced, is permitted to do so by personal appearance in Court. The out-of-towner who must return home between the time when the summons is issued and the day when he is directed to appear in court is the only offender who has the privilege of setting forth his explanation in the form of a letter addressed to the presiding Magistrate.

The acceptance of parking fines by mail has made it possible for the judges to devote much more time to the careful examination of cases involving poor driving habits and unauthorized driving. This concentration upon the potential killer behind the wheel is well worth the effort. Plans are now under way toward the institution of a program under which Magistrates may send persistent violators to New York University's Center for Safety Education for supplementary driving instruction.

### Why Not Fingerprint All Drivers?

When Willie Sutton was first questioned as he was changing his auto battery, after having been recognized by Arnold Schuster, he was able to convince the two police officers who spoke to him that he was not Sutton but that his name was Charles Gordon. He proved his identity by showing a driver's license under that name. The license gave every indication of being regular and in proper order, and Willie the Actor very nearly got away again.

The *New York World-Telegram and Sun* was able to show in a

series of articles which followed Sutton's arrest that it was very easy for anyone to get blank license forms from the New York State Motor Vehicle Bureau and that it was no problem at all to obtain rubber stamps precisely like those used by the Bureau. The issuance of forged drivers' licenses is, to all indications, a well-organized racket. Solutions suggested in various quarters included the proposal for strict control over license blanks and the use of a distinctive type of seal for the stamping of licenses. I stated at the time and I repeat now that the only method, in my opinion, by which the license-issuing racket can be eliminated is to require the fingerprinting of all applicants for original licenses and for renewal of existing licenses.

If all states were to adopt such a measure *at once,* many thousands of unauthorized drivers would stop driving *immediately* and the police departments fighting a losing battle against the activities of organized car-theft rings would gain an important advantage. In addition to these benefits, the filing of such prints with the Federal Bureau of Investigation would focus attention upon the Willie Suttons and their partners in crime and would prevent the issuance of licenses to those whose privilege had been denied in any state because of repeated violations, financial irresponsibility or any other valid cause.

There was a time not so many years ago when any proposal for the fingerprinting of large classes of persons was met with cries of regimentation and with demagogic tirade. Then came World War II, with millions of Americans joining the armed forces and being there fingerprinted; millions of others submitting to fingerprinting in conjunction with civilian defense activities, and still additional millions of decent, hard-working citizens being fingerprinted in connection with the war industries. It has clearly been established by the events of recent years that the compulsory fingerprinting of any man, woman or child violates no basic individual privilege or right. This is particularly so—and has been so held by the courts—where it is part of the requirement for the issuance of a privilege or right by a government agency.

Today, in New York City, if one joins the civil service or applies for a gun permit or a taxicab license or a tow-car license, seeks a license to work as an auctioneer, a junk dealer, a keymaker, a lock-

smith, a public porter, garage attendant, second-hand dealer, bootblack or newsdealer, or to drive a horse-drawn hack through Central Park, he must be fingerprinted. One who seeks the privilege of operating an employment agency, a bowling alley, a bathing establishment, a miniature golf course, or practically any other type of public amusement or facility, must submit to this form of identification.

In New York's municipal hospitals and in many voluntary and private hospitals today each new-born child is footprinted and the mother is fingerprinted, and this becomes a part of the permanent record of that birth. There is hardly anyone in this country today who has not at some time or other been fingerprinted, and there is no sensible reason why, with traffic fatalities as our Number One Killer in all parts of the country, we should not have a compulsory fingerprinting requirement for all those who apply for the privilege of handling a potential instrument of death.

### Carrying the Badge of One's Offense

Another urgent reform, long overdue, which I believe would at once guarantee greater safety through better control over the operations of traffic law violators, relates to the form of driving licenses. New York licenses provide spaces in which are noted the offenses of those who are convicted of moving violations such as dangerous driving, speeding, passing a light or stop sign, driving through a play street, driving the wrong way on a one-way street, making improper turns, failing to give right of way and so forth. Very few other jurisdictions issue this type of license.

Many an offender, before the bench in Traffic Court, pleads for the opportunity to make an explanation and ends up with the prayer that the offense be kept off his license. "I don't mind paying the fine," says this offender, "but I'd like to keep my license clean." The answer must be *no* in all cases since the law *compels* the stamping of the license in moving violations and forbids the waiving of that requirement. Compelling the offender to carry the badge of his offense where he will be reminded of it each time he looks at his license acts as a deterrent, in most cases, against future temptations

to "take a chance" that there is no police officer watching. Taking that chance often results in death or injury to the driver or, worse still, to his innocent victim.

Commissioner Warren N. Gaffney of the New Jersey Commission on Interstate Cooperation recently proposed that motorists convicted of careless driving be required to carry a red tag on their car windows for one year as a warning to others. The American Institute of Public Opinion conducted a nation-wide poll on this proposal and announced last January 4th that 76% of those polled had expressed themselves in favor of such a plan.

Since there is so much to be done in this direction, I would not at first recommend so extreme a measure as that suggested by Commissioner Gaffney (though I would heartily approve of such a plan) but I do very strongly feel that efforts should be made to get all states to adopt the type of licenses now in use in New York and a few other states, with spaces for the notation of moving violations. A step further—and a most important one—would be an agreement among states for the stamping of licenses issued by sister-states.

Today, if a New York driver residing in Westchester County one block from the Connecticut border, passes a red light, he shows his license in court and it is stamped. His neighbor from Connecticut, on the other hand, passes the same light at the same place and pays the same fine on the first offense in the same court, but *his* license is not stamped. On the second and on the third offense the New York driver pays increasingly higher fines because of the marks on his license. If he has too many such marks, the Motor Vehicle Bureau may investigate his fitness as a driver and may suspend or revoke his license. The Connecticut resident, whose license does not show previous offenses, is likely to be treated as a first offender on each occasion and will be allowed to continue to drive in New York State even though, if he had been a New York driver, he would probably have lost his license because of repeated offenses.

With measures now existing in New York and in some other individual states for the revocation and suspension of licenses of repeated offenders, serious attention should be given by all jurisdictions to the advisability of setting up a uniform system which will ensure mutual cooperation in the treatment of traffic law violators.

Surely an unfit driver is a menace to the safety of the citizens of sister-states just as much as to the residents of the state in which he is licensed.

## Conclusion

The reduction of accidents, the saving of lives and the minimizing of human grief are part of the great ultimate aim to which New York City's Traffic Courts are devoting themselves year after year. The amounts collected in fines are incidental, and I know that all Magistrates and all of our city authorities would gladly compromise for fewer fines and curtailed income if concomitantly this would mean fewer violations and greater respect for the police, the courts and the rights of others.

As long as I am Chief City Magistrate I shall continue to devote myself with all the fervor and ingenuity at my command to vigorous and impartial enforcement of the laws, completely free of special privilege or improper influence. I know that I enjoy the support and endorsement of my colleagues in this effort. We are constantly trying to improve our efficiency in the important work of our courts in the hope that our efforts, with the facilities now at our command and the refinements that in time will develop, will show multiple and increased benefits for the happiness and well-being of the millions who look to us for protection.

# Compulsory Insurance Compared with Financial Responsibility Laws

RAY MURPHY

*Mr. Murphy has been general counsel of the Association of Casualty and Surety Companies in New York City since 1944. In that capacity, he directs one of the country's largest legal staffs dealing with insurance matters. He had joined the Association in 1938 as Assistant General Manager. Prior to that, he had served as Insurance Commissioner of Iowa, as county attorney of Ida County, Iowa, and city attorney for Ida Grove, Iowa. He also practiced law in Oregon.*

THE greatly increased number of motor vehicle accidents in the last few years—a matter of national concern—has focused attention on ways and means of immediately reducing the toll. A by-product has been renewed interest in finding the best way to provide financial protection for those injured as the result of the negligent operation of motor vehicles.

Inevitably this has revived the old argument between proponents of financial responsibility laws and the disciples of compulsory insurance. It was an argument rampant in the thirties but virtually dormant through the forties when many states enacted security-type financial responsibility laws.[1]

Let us define our terms. A compulsory insurance law requires the owner of a motor vehicle to possess liability insurance before his car can be registered.[2] By "security type financial responsibility

[1] Alfred J. Bohlinger, Superintendent of Insurance of New York, recently stated: "The past year has seen the question of compulsory automobile insurance debated with a fervor unknown over nearly three decades of discussion and controversy." Address delivered at Pittsburgh Insurance Day Luncheon, Hotel William Penn, March 11, 1952.

[2] "The Problem of the Uninsured Motorist," a report by Deputy Superintendent George H. Kline and Special Assistant Karl O. Pearson to Superintendent of Insurance Alfred J. Bohlinger, on page 13, in setting forth some definitions states: "Compulsory Automobile Insurance is commonly used to refer to any plan whereby the purchase of automobile bodily injury and property damage liability insurance of specified amounts is made a prerequisite to the registration of a motor vehicle. Where the term is used to refer to the plan currently in effect in Massachusetts, it means the requirement of automobile bodily injury liability insurance only, since property damage liability insurance is not required in that state."

law"[3] is meant the type of financial responsibility law first enacted in New Hampshire in 1937 and, by latest count, enacted in thirty-nine states and Hawaii.[4] It is not to be confused with the old type of financial responsibility law which provides for the suspension of driver's license and registration on the non-payment of a judgment.[5] With a few minor variations from state to state the security type financial responsibility law works as follows:

Within ten days after an accident that results in death or bodily injury to a person, or in property damage in excess of $100, the owner or operator of every car involved must file a written report with the administrator of the law, regardless of who may have been at fault. If the owner or operator of a car so involved had in effect, at the time of the accident, any form of insurance that would cover damage claims arising out of the accident, up to $11,000,[6] that owner or operator is not subject to the remaining provisions of the security type financial responsibility law.

If the owner or operator of a car so involved did not have the proper kind of insurance in effect at the time of the accident, the commissioner must, within sixty days after receipt of the accident report, require the owner or operator to deposit sufficient security

[3] Some refer to the security type financial responsibility laws as "safety responsibility laws" and to the old type as "financial responsibility laws." The New York Insurance Department study, supra note 2, defines "safety responsibility laws" (i.e., security type financial responsibility laws) as follows: "Safety Responsibility Laws are generally understood to be laws which force the owner or operator of an uninsured vehicle which has been engaged in an accident causing personal injuries or property damage, sometimes in excess of a stipulated amount, to post security and to maintain proof of financial responsibility in the future until certain stipulated conditions are met. These conditions usually permit the maintenance of financial responsibility to be lifted after payment of judgment, the failure of the injured third party to sue, the entry of a release, etc."

[4] Alabama, Arizona, California, Colorado, Connecticut (effective 6/1/52), Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi (effective 1/1/53), Montana, Nebraska, Nevada, New Hampshire, New York, North Dakota, Ohio (effective 3/1/53), Oklahoma, Oregon, Pennsylvania, Rhode Island (effective 1/1/53), South Carolina (effective 1/1/53), Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming. The New Jersey legislature passed a security type bill which had not been acted upon by the Governor when this article was written.

[5] The old type is in effect in Arkansas, District of Columbia, Kansas, Missouri, New Jersey, New Mexico, North Carolina, and South Dakota. The old type has had no appreciable effect in increasing the number of insured motorists for the motorist knows that under the law he cannot lose his license and registration except for non-payment of a judgment and only rarely will cases be prosecuted to judgment involving uninsured cars.

[6] $5,000 covering damages to one person and $10,000 in event two or more persons are injured, and $1,000 covering liability for property damage. Under New York law the so-called statutory limits are $10,000/$20,000/$5,000.

to cover the damage for which he may be liable, up to $11,000. If the owner or operator does not comply with the requirement by making the deposit or by filing a release or an agreement for installment payment, his privileges to *own* or *operate* a motor vehicle are suspended until the law is satisfied, or one year has elapsed without court action for damages being filed.

## Results

The security type financial responsibility law does not compel the purchase of insurance. The enactment of such a law, however, does have the effect of increasing the number of insured cars. In New York, the only large state having such a law for ten years, it has been estimated that 94 per cent[7] of the motor vehicles on the highways carry liability insurance covering both bodily injury and property damage. Prior to the adoption in New York of the security type law only an estimated 33 per cent of all motor vehicles were insured.

The protection under the New York law goes well beyond that which is afforded by the fact that 94 per cent of New York cars are insured. In 1950 alone more than 7,200 uninsured operators in New York deposited security exceeding $1,300,000 covering accidents in which they were involved.[8] The same year approximately 22,500 releases were filed by uninsured operators who had settled all claims against them.[9]

Thus, we see the security type financial responsibility law in New York has provided, in practice, protection against financial loss from more than just the 94 per cent of insured cars. These figures show that the New York law succeeded in obtaining financial protection for a large number of persons who had accidents with uninsured cars.

[7] This estimate is based on reports of New York Motor Vehicle Bureau. While it has varied based on statistics used, it has never been set lower than 90 per cent. See pages 10 and 11, New York Insurance Department study, supra note 2. A proposal recommended by Governor Dewey which authorizes the motor vehicle commissioner to require owners of motor vehicles on application for registration to state whether they have liability insurance was enacted into law (Chapter 166, Laws of 1952). This law is designed to provide means of obtaining an accurate count of the number of insured drivers for statistical purposes.

[8] Annual Report of Department of Taxation and Finance, page 64 (Legislative Document (1951) No. 88).

[9] Ibid.

## Experience with Compulsory Insurance

If any examination of compulsory motor vehicle insurance is to be made, the Massachusetts law must be scrutinized, for it is the only state in the union that has enacted such a law. First, contrary to popular belief the Massachusetts compulsory liability insurance law does not assure compensation to every person suffering bodily injury. For example, it does not apply to:

1. Accidents in which the individual causes his own injury;
2. Accidents caused by motor vehicles not registered, or where no insurance is in force in respect to the car involved;
3. Accidents caused by stolen cars;
4. Accidents caused by hit-and-run drivers who are not caught; and
5. Accidents where there is absence of legal liability.

It is true that a security type financial responsibility law is also inapplicable to some of the factual situations just mentioned[10] and the only reason for stressing the non-application of a compulsory law is to correct the widespread erroneous impression that there would be *no* uncompensated accidents were a compulsory law enacted.

In addition there are a number of indisputable defects in the Massachusetts compulsory law:

1. It applies only to accidents that result in death or bodily injury, and again contrary to popular belief, it does *not* apply to accidents resulting only in property damage which are far more numerous than bodily injury accidents;
2. Neither does it apply to bodily injuries or deaths that occur to guest occupants (whether or not members of the owner's family), a coverage included in the standard liability automobile policy in all other states;
3. It does not apply to motor vehicles registered in other states. Automobiles registered in other states, commonly referred to as

[10] The security type financial responsibility law would not apply to self-inflicted injuries, to injuries caused by hit-and-run drivers who are not caught, and to injuries where there is no legal liability. The sanctions of the security type law would apply, however, to accidents caused by unregistered cars or where no insurance is in force, and to accidents caused by stolen cars.

"out-of-state cars" alone account for approximately 5 per cent of the traffic accidents in Massachusetts;[11] and

4. It applies only to accidents that occur on the public domain, thus omitting any required protection for accidents that occur in filling station areas, parking lots, garages, private driveways and other areas that are not publicly owned.

Contrast the insurance protection which the Massachusetts law compels every car owner to buy with the broad coverage which the 94 per cent of New York car owners buy. Under the requirements of the New York law, a policy provides extraterritorial coverage, covers guests whether or not members of the family, and perhaps most significantly it covers liability for property damage up to $5,000.

Wholly apart from the limited coverage which Massachusetts compels an owner to carry, it is a fact that Massachusetts car owners purchase less additional protection than do owners in states having security type financial responsibility laws. For example:

1. Fewer Massachusetts motorists buy insurance in excess of the required limits ($5,000/$10,000) than in any other state even though the basic limits are the same in most other states;[12]

2. Medical payments insurance is bought with only about 35 per cent of the statutory policies in Massachusetts. It is purchased with about 54 per cent of the automobile liability policies sold outside of Massachusetts;[13] and

3. Guest coverage which is an optional liability coverage in Massachusetts is bought with only 65 per cent of the statutory liability insurance. Outside Massachusetts all automobile bodily injury liability policies include guest coverage.[14]

11 Report of Motor Vehicle Accidents in 1949, Registry of Motor Vehicles.

12 Report relating to the State of New York, Insurance Industry Committee on Motor Vehicle Accidents—November 1951, pages 18 and 19, Library of Association of Casualty and Surety Companies, 60 John Street, New York 7, N.Y.

13 Ibid.

14 Ibid.

### Difficulty in Passing 'Better' Insurance Law

Why cannot a compulsory motor vehicle insurance law be enacted which will provide the same protection as the New York statutory policy? Leaving aside possible constitutional questions relating to out-of-state coverage and to off-the-highways coverage, the enactment of such a law is "theoretically" possible. But if we look to Massachusetts, we learn that Massachusetts has restricted rather than enlarged the coverage it forces motor vehicle owners to buy.

First, it never required property damage liability coverage and then it excluded guest coverage. The explanation lies in an inherent characteristic of a compulsion law. Rather than accept rate increases actuarily sound and necessary, the legislature restricts the coverage it compels car owners to buy.

Even if a broad compulsion law could be enacted, one which would afford coverage comparable to that required by the security type financial responsibility law, the enactment of such a law would not be in the public interest. First, political pressures are either absolutely inherent in, or bound to follow, any compulsory liability insurance law.

For example: with the enactment of the compulsory law in Massachusetts, there followed a violent upsurge in the number of motor vehicle accidents in that commonwealth. Yet when a commissioner of insurance of Massachusetts was about to promulgate the higher rates he knew were justified, the Governor intervened and attempted to get the commissioner to promulgate rates lower than the proposed rates. The commissioner resigned and in his letter of resignation said:

"Either I must promulgate the rates as computed by me in the Department, or I must resign my office... As I view the whole matter now, this unusual situation of an under executive having to contest with his superiors in authority is the result of an attempt to solve a mathematical problem by the introduction of a political factor of expediency. This is neither right nor proper." [15]

[15] Letter of resignation of Insurance Commissioner Wesley E. Monk, submitted to the Governor of Massachusetts in 1928. Letter is printed in Liberty Mutual Insurance Company vs. Acting Commissioner of Insurance, 265 Mass. 23, 163 N.E. 648, 649.

Under the Massachusetts law the commissioner of insurance is required annually to re-examine the motor vehicle liability insurance rates and promulgate new rates. Every year since 1927 Massachusetts has been the scene of violent political charges and countercharges.[16] Certainly the political arena is not the proper place to review objectively and dispassionately loss experience and to determine on the basis of such experience proper premium rates for the coming year which will take into account factors that can reasonably be expected to develop in the near future. Some have contended that automobile insurance rates could become a political football under a security type financial responsibility law.[17] The argument has been made that if rates continue upward they must necessarily enter the field of politics no matter what kind of law is on the statute books. There are two answers to this: (1) up to the present time automobile liability insurance rates have *not* become a political football under security type laws even in congested metropolitan areas where rates are high, and (2) under the Massachusetts law premium rates have always been subjected to political pressure even when rates were low and the trend downward.

Continuous political pressure on premium rates is not just a sideshow which, while annoying, can be tolerated without any disastrous consequences. The matter is much more serious. It is doubtful whether private insurers could continue to write liability insurance in many states if political pressure compelled them to charge a rate which was inadequate to cover losses and expenses.[18]

Another effect of a compulsion law is equally important. A compulsory law discourages innovations and has the effect of freezing forms and coverages. In Massachusetts there is an identity of classification, rates and coverage applicable to all insurers. Under the security type responsibility law there is competition among different groups of insurers and independent insurers in classification, rates and coverage.

[16] New York Insurance Department study, page 60, supra note 2.

[17] New York Insurance Department study, page 61, supra note 2.

[18] Governor Driscoll of New Jersey has been quoted as stating: "If any substantial number of states adopt compulsory liability insurance, I am inclined to believe it may lead ultimately to government taking over that type of insurance." Newark News and Trenton Times, February 1, 1952.

### The Standard Insurance Policy

One of the broadest policies sold by any insurance company is the standard automobile policy. That policy could not have been developed under a compulsory law, an outstanding characteristic of which is to confine and limit coverage. If many states had compulsory motor insurance laws, the medical payments coverage which is an integral part of the standard automobile policy, and available for a small additional sum, could never have been devised. This coverage applies regardless of fault and thus provides some compensation in a substantial number of cases where there is no right of action against another person.

It is akin to accident insurance bought in conjunction with an automobile liability insurance policy. It can be purchased in limits up to $5,000. Many a motorist has had reason to appreciate the value of medical payments coverage and other features of the standard policy. This policy undoubtedly will be further broadened and perfected in the ensuing years but cannot, it is submitted, continue its growth and development under a compulsion law.

We have seen that a compulsion law has proved defective in two highly important respects: (1) endless political pressure on rates and (2) discouragement of competition and no improvement in forms and coverage. On the other hand, the security type financial responsibility law has been highly successful in many states. In New York we have seen that approximately 94 per cent of the motorists purchase a form of insurance far broader than that required by the Massachusetts law. We have also seen that in one year over 7,200 uninsured operators in New York deposited security exceeding $1,300,000 covering accidents in which they were involved and in the same year 22,500 releases were filed by uninsured operators who had settled all claims against them. In addition, motorists in security type financial responsibility law states buy *more* additional protection than do Massachusetts motorists.

In the light of all these facts why should there be any clamor for compulsory insurance? A very simple answer suggests itself. We are *trying to do something* about the appalling number of automobile accidents. True, compulsory insurance is no antidote to the problem.

At best all it can do is to underwrite a national tragedy but the fact remains that some of our good citizens have espoused compulsory insurance as the cure-all to motor vehicle accidents. They are striving to cure the disease by treating one of its symptoms, the uncompensated victim of an accident.

It is time we set our sights a lot higher. We must come to grips with the basic problem by reducing motor vehicle accidents to the irreducible minimum. In the meantime let us not be misled into believing that the answer lies in the enactment of a compulsory law. Its shortcomings and socially undesirable effects are borne out by twenty-five years' experience in Massachusetts. The security type law, on the other hand, has been adopted by forty jurisdictions. All of these rejected a compulsory law in favor of a law which has been highly successful *without* any of the defects inherent in a compulsory law. In the light of past and current experience the decision of those states is just as sound today as it was when their laws were enacted.

# Portland Protects Its Pedestrians

DOROTHY MCCULLOUGH LEE

*Mrs. Dorothy McCullough Lee is mayor of Portland, Oregon. She was engaged in law practice continuously from 1923 to 1943, when she accepted a position on the Portland City Council. She served as a member of the State House of Representatives in 1929 and 1931 and was then elected State Senator, serving until 1943 when she resigned to become Commissioner of Public Utilities for the City of Portland. She had also previously been chairman of the Oregon Crime Commission for four years, and a member of the Portland Traffic Safety Commission for several years. In 1940 she was Municipal Judge of Portland. From 1944 to 1948, she served as a member of the City Council, first elected to the unexpired two-year term to which she had been appointed, and re-elected for a full four-year term. In May, 1948 she ran for Mayor and received nearly a two-thirds majority of the votes cast. She was sworn in as Mayor on December 31, 1948 for a four-year term.*

STRANGERS in the city of Portland often are mildly amazed to see pedestrians march up to an intersection, glance at the traffic signal, and wait patiently for the favorable light to appear before proceeding across the street. This, even though there may be no cars approaching at the moment—a fact that may cause the stranger to leave the Portlanders standing at the curb as he proceeds across the street against the signal.

It was not always thus. There was a time when Portlanders, too, would disregard the traffic signal and walk across the street, trusting solely to their own judgment as to the hazard involved. But not any more. Today, the city of Portland has nearly 100 per cent pedestrian observance of traffic signals . . . and the pedestrian accident record reflects this salutary condition. Of course, this situation did not just happen. It was brought about by a planned program, and it is sustained through a consistent application of the city's well-balanced pedestrian protection program.

In 1944, traffic officials in Portland became alarmed at the marked upsurge in traffic deaths and injuries which the city then was experiencing. A study of the accident reports indicated that in

line with the fatality records of other American cities, the majority of those killed in traffic accidents were pedestrians. The study brought out the additional fact that in a majority of cases, the pedestrian was at fault in the accident.

### Emphasis on Three E's

The significance of these facts was inescapable. In Portland's program to reduce traffic accidents, a major causative factor, the pedestrian, largely was being overlooked. The obvious need was for far greater emphasis to be placed on the pedestrian protection phase of the city's accident prevention program. This increase in emphasis, the traffic officials decided, should take the form of a stepped-up program of law enforcement, education and engineering, the standard formula for traffic accident prevention.

The mechanics of the three-E's of accident prevention in Portland involve the cooperative efforts of the Traffic and Transportation Commission and the official city agencies charged with traffic law enforcement and traffic engineering. The commission is a semi-official agency, with lay members appointed by the mayor and with a paid staff financed from funds derived from parking meter revenue. In addition to its responsibility for safety education, the commission acts in an advisory capacity to the city council on matters pertaining to traffic. The commission, in its role as a safety organization, is a chartered member of the National Safety Council.

Portland's pedestrian problem is aggravated by the long periods of dark, cloudy, rainy weather in this area. When heavy outer garments are required, they usually are dark in color. Rain and condensed moisture on windshields add to the reduced visibility of pedestrians to the motorist. Still another factor to be considered in the city's pedestrian problem is the short block prevalent in the congested downtown area.

Bearing these and related factors in mind, the city's traffic officials aimed their stepped-up program at the pedestrian himself. Because their studies had shown that in a majority of cases the pedestrian was at fault in the accidents, they inaugurated the pedestrian safety school in March, 1945. Announcement of plans for

the school was preceded by a press and radio campaign to acquaint the public with the seriousness of the pedestrian problem. Prior to this, for several months, traffic law enforcement officers conducted an intensified program of issuing courtesy warnings to pedestrian violators. During the months of October and November of 1944, 10,000 warning cards were issued bearing the legend, "You were lucky. You jaywalked and escaped without injury."

### Pedestrian Safety School

When the pedestrian safety school opened in March, 1945, police officers began to make straight arrests for pedestrian violations. Offenders were given the choice of (1) appearing in traffic court, (2) posting and forfeiting $2 bail, or (3) attending a session of the safety school. This is the system in operation today with the exception that beginning in 1950, bail for pedestrian violation was raised from $2 to $5 and motorists who fail to yield right of way to a pedestrian are permitted to attend the school in lieu of posting bail or appearing in court.

The school is a one-hour meeting conducted each Tuesday evening in the City Council Chamber at City Hall. Traffic tickets are accepted and violators are registered by police officers on duty at the door. The program is conducted by staff members of the Traffic and Transportation Commission.

It has been found to be desirable in opening such a meeting to dispel if possible any feeling of apprehension and resentment that may be held by those attending. This is done by assuring the audience that individual citations will not be discussed, and that no one will be singled out to be embarrassed as a "horrible example." They are invited instead to look upon the school as a community meeting being held to discuss an important community problem.

A brief description of the city's traffic accident problem is then presented, and the reasons for establishing the pedestrian safety school are explained. The 16 mm. film, "And Then There Were Four," is next shown. While this picture does not deal with the pedestrian, it does point up the tragedy of traffic accidents and

hammers home the central thesis that "there is no such thing as a 'minor' traffic violation."

The film is followed by a chalk talk, during which the audience is invited to take a look at some of the bad habits they would see during a typical walk through the downtown business district. While the treatment is light, important points regarding unsafe pedestrian habits are brought out and in discussion that follows, safe walking habits are emphasized. The meeting closes with a short talk from one of the police officers on duty who usually relates an accident story from his experience to illustrate the importance of obedience to the pedestrian ordinance.

### Effects of the School

Last year, approximately 16,000 persons attended the weekly sessions. We are convinced that virtually everyone who attends the school carries away a greater understanding of the traffic accident problem and a more sympathetic attitude toward the pedestrian protection program which is being carried on in Portland. There is concrete evidence of the program's success in the pedestrian fatality records. In 1945 when the school was started, there were 45 pedestrian deaths of which 51 per cent were pedestrian-caused. In 1951, there were 27 pedestrian fatalities of which only 40.7 per cent were pedestrian-caused.

A survey conducted by the Traffic Engineering Bureau to determine pedestrian obedience last December indicated that this city has 95 per cent observance of pedestrian signals in the downtown business district.

An integral part of the educational program carried on the year round is the public and parochial school activities, conducted by the safety education unit of the police traffic division in cooperation with the Traffic and Transportation Commission. Traffic safety assemblies are staged by police officers from the safety education unit.

A unique approach to the pedestrian protection phase was utilized during the past year when a blind girl with a highly trained

guide-dog made numerous appearances before assemblies of students to describe her problems and experiences in getting around in traffic. Chalk talks by a staff member of the commission help put over pedestrian safety rules that apply particularly to students.

### Press and Radio Releases

The commission carries on a public information program, a large proportion of which is devoted to pedestrian safety matters. News releases are sent to the two large daily newspapers and to a number of small weekly papers in the city. These releases are keyed to specific conditions, such as weather, holidays, hours of darkness, etc. Shortly after Portland's one-way street grid was inaugurated, the following announcement was widely used by the city's radio stations:

"Here's a suggestion to pedestrians from the Traffic and Transportation Commission: When crossing the street in the one-way area, watch for turning cars. Speed of traffic has increased greatly, so cross only at intersections, cross only on the walk signal, and watch for turning cars."

In addition to spot announcements, the commission sponsors a weekly 15-minute broadcast over the local CBS outlet entitled "Danger Ahead," with many of the programs directed at the pedestrian problem. Last fall, as dark days and rainy weather set in, the commission in cooperation with the traffic engineer's office arranged to have sidewalk stencils with a pedestrian safety message stenciled at approximately eighty locations in the downtown shopping area.

The commission works continually to promote traffic safety activities among community organizations and to assist these groups in conducting projects they undertake. During the Christmas holiday seasons, the Portland Area Council, Boy Scouts of America, sponsors a pedestrian safety campaign in the downtown shopping district.

Four teams of two scouts each parade among downtown throngs of Christmas shoppers, bearing placards with pedestrian safety messages. On the Saturday before Christmas Day, some fifty scout observers station themselves at downtown intersections and distribute safety leaflets to pedestrians who cross the street properly.

FIGURE 1. For blind pedestrians, Portland developed a special button to indicate the "Walk" signal by a buzzing sound and strong vibration.

FIGURE 2. Night view of overhead illumination for marked crosswalks where pedestrian volumes and vehicular volumes are heavy in Portland.

FIGURE 3. Manual operation of traffic signals by patrol members at complicated intersection.

FIGURE 4. A school assembly skit illustrates safe walking practices.

The leaflets congratulate the pedestrian on his safe habits and serve as a subtle reminder that observance of pedestrian rules prevents accidents.

Portland has a sound pedestrian law upon which to base an effective program of enforcement for pedestrian protection. By ordinance, the City Council has adopted the pedestrian section of the Motor Vehicle Laws of the State of Oregon, which are based on the Uniform Motor Vehicle Code. The ordinance definitely establishes pedestrian right of way at intersections in the following wording:

"When traffic control signals are not in place or not in operation, a driver of a vehicle shall yield the right of way, slowing down or stopping, if need be so to yield, to a pedestrian crossing the roadway within any marked crosswalk, or within any unmarked crosswalk at an intersection when the pedestrian is upon the half of the roadway upon which the vehicle is traveling, or when the pedestrian is approaching so closely from the opposite half of the roadway as to be in danger, but no pedestrian shall leave the curb or other place of safety suddenly and walk or run into the path of a vehicle which is so close that it is impossible for the driver to yield."

It is in accordance with the provisions of this ordinance that traffic officers issue citations to drivers for failure to yield the right of way to pedestrians at intersections. Also, under this provision, the Portland Junior Safety Patrol functions to aid students in crossing at strategic intersections near schools, with drivers being cited for failure to observe this right of way law.

## Junior Safety Patrols

Portland's Junior Safety Patrols differ radically in operation from standard school safety patrols throughout the country. While the patrol members are intended primarily to control the movement of school children, rather than vehicular traffic, they are empowered by city ordinance to stop vehicular traffic while groups of children cross the street. The patrol uses a red flag with the word "STOP" in white letters. Patrol members stand on the curb, or in certain instances where parked vehicles would obstruct their view of approaching traffic they stand in circles marked on the pavement six feet from the

curb. When the patrol member holds his flag out into the street at a 45 degree angle, motorists are required by law to stop and remain standing until the patrol member lifts his flag.

Members are instructed to report to their principal the license number of automobiles which violate their signal, and the principal in turn reports to the police department. A letter is then sent to the registered owner of the vehicle over the signature of the Chief of Police, pointing out in a courteous manner the extreme danger of the violation and requesting cooperation. In the case of flagrant violations, drivers have been cited to appear in court with the Junior Safety Patrol member giving testimony in the case. No such case has been lost since the patrol has been in operation.

The Junior Safety Patrol is trained and supervised by a safety unit of the Police Bureau consisting of three officers and a sergeant. Each officer is detailed to work with the patrols in approximately thirty public and private schools and these officers spend full time on this job during school terms. Patrol members receive continuing training and supervision from these officers and the success of the system is indicated by the fact that in over thirteen years of operation, only two children have been injured at crosswalks guarded by patrol members.

## Walk-Wait Signals

Portland has what is believed to be the country's largest area of street intersections controlled by signal installations that incorporate the pedestrian walk-wait lights. These signals were developed under the direction of Fred T. Fowler, Portland's nationally-known traffic engineer, and they have been adopted as part of the national uniform standard for traffic signals.

Pedestrian walk and wait signals serve two important purposes in the traffic signal system: 1. They are installed at complicated intersections to reduce the total number of signal faces the vehicle drivers must observe, since the walk-wait signals may be used to guide pedestrians in directions that vehicles do not follow. 2. Pedestrian walk-wait signals are important in achieving successful operation of a progressive signal system on a street having a heavy volume of pedestrian traffic.

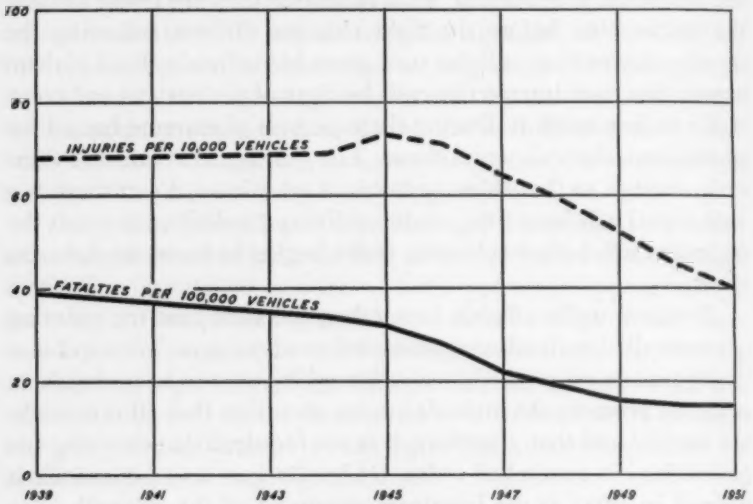
In Portland, the wait signals are timed so that the pedestrians will be on the sidewalk when there is the greatest danger due to vehicles crossing pedestrian lanes. On a progressive signal system, such as Portland has, vehicles attain their greatest speed, and drivers tend to be the least cautious about pedestrian traffic, during the last few seconds of the green signal. That is because they are trying to clear the intersection before the light changes. Drivers following the signals progressively as lights turn green immediately ahead of them expect that each intersection will be clear of pedestrians and cross-traffic as they reach it. During these periods of extreme hazard for pedestrians, the wait signal shows. The wait signal is timed to show early enough so that those pedestrians who leave the curb with a walk signal will have time, under ordinary conditions, to reach the opposite curb before vehicular traffic begins to move on the cross street.

Portland traffic officials have taken the view that the painting of crosswalks has disadvantages as well as advantages. They feel that if a large scale program of crosswalk marking were to be undertaken, it would promote the attitude among motorists that all crosswalks are marked and that, therefore, it is not required that they stop for pedestrians in unmarked walks. Under Oregon law, a crosswalk is defined in effect as the imaginary extension of the sidewalk lines across the street. Motorists must yield the right of way to pedestrians who have entered their half of the roadway or who are close enough to be in danger, regardless of whether or not the crosswalk is marked. Portland therefore marks crosswalks at complicated intersections, between intersections where pedestrian volume necessitates a crossing, and at intersections where pedestrian volume is so heavy as to require the marking for control of movement. This applies largely to the downtown business district.

Where crosswalks are marked in the downtown area, the diagonal dividing line system is used as a means of "funneling" walkers to the right side of the crosswalk to prevent confusing congestion in the center of the street. This system has proved very successful in Portland.

An additional disadvantage of marking crosswalks is that the pedestrian is inclined to place too much confidence in the painted

markings, whereas the motorist is often inclined to ignore them. Several experimental installations of overhead illuminated crosswalk markings have been made on high-speed arterials where pedestrian volumes are heavy, but no data on the effect of such illuminated markings are yet available.




City of Portland, Oregon

FIGURE 5. Comparison of Pedestrian Injuries and Fatalities with Vehicle Registration, 1939 through 1951

Pedestrian Injuries Per 10,000 Vehicles
Pedestrian Fatalities Per 100,000 Vehicles

## Other Pedestrian Safeguards

Concrete pedestrian refuge islands have been constructed in the center of several wide thoroughfares at locations where pedestrian volumes warrant this type of construction. Usually such islands are provided at locations where the pedestrian, starting across on the walk signal, may be caught midway when the lights change. The pedestrian refuges also serve as medial dividers to channelize the movement of vehicular traffic.

A special traffic signal has been developed for the use of blind

pedestrians in the vicinity of a school for the blind in Portland. Students at the school must cross a high-speed arterial state highway, and the hazards at the intersection had led them to name it "Death Valley." The signal installation was expanded to include a special button which is large and easy to locate. Blind pedestrians who press the button will hear a buzzer sound when the "Walk" signal comes on. The button does not actuate the light, which is timed progressively with a series of signals on the thoroughfare, but merely informs the handicapped person when he may cross the street. Pedestrians who are both blind and deaf benefit from the special installation, since a distinct vibration may be felt through the button when the buzzer sounds.

At several school crossings where heavy traffic warrants mechanical aid for the Junior Safety Patrols, a special school signal has been installed. The light is normally off until the patrol member unlocks it with a key obtained from the school principal and turns it on. A control button operated by a member of the patrol changes the light to red when desired.

The Portland program for pedestrian protection provides an excellent illustration of the effectiveness of a balanced program of Education, Enforcement and Engineering for the control of accidents in traffic. Traffic authorities carefully avoided placing full confidence in any one phase of accident prevention in their attack on the problem of the pedestrian accident. Virtually every measure adopted for the protection of the pedestrian involves at least two of the Three E's. The pedestrian safety school, for example, offers education to persons who are brought to the school as a result of intelligent enforcement. The development of pedestrian walk-wait signals would have had little effect if the public had not been persuaded to observe them, and this was done and is being done continually through the educational program in the schools and for the public. The Portland experience would seem to offer one more bit of evidence indicating that the standard formula for accident prevention, intelligently applied, can produce favorable results.

# Coordinating All Parking Facilities Under the Unified 'System Concept'

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WE FINALLY are making progress in solving the parking problem. Billions of words have been spoken about it. Facilities have been inventoried and needs surveyed in countless urban areas of the United States. Enabling legislation of unprecedented volume and quality has been enacted. Courts have unequivocally endorsed the provision of parking facilities as a public use, and special administrative machinery has been set up to deal with the problem. The physical facilities themselves are finally being constructed in cities of many complexions.

Out of all this activity have recently emerged several concepts of great practical significance to the timely provision of automobile parking facilities. Among the most important is the principle of a *system* of parking facilities.

### Definition

Under the system concept, both curb and publicly owned off-street automobile accommodations are integrated into a single chain of facilities. Both are considered together, including existing facilities and estimated needs. The system principle is generally authorized by state enabling statute in general terms and by local executing ordinance in more specific language. In their physical, functional or operational aspects, all public parking facilities, curb and off-street, are considered as parts of a whole. In financing any part of the system, the revenues from any other part and from all facilities can provide a financial foundation for the whole system. Thus from all points of view—physical, functional, financial, legal, or economic—the system idea integrates, unifies, and consolidates.

This, then, is the system concept in general terms. But more specifically, what are its outstanding characteristics, in each of the several different aspects referred to? Why is the system concept important from a physical point of view, involving the amount and location of automobile parking facilities?

Parking surveys in many cities reveal that curb and off-street parking spaces are interrelated both in their location and design features with respect to the parking generators they serve. A given use or structure creates the need for a given number of parking spaces; if these are available at the curb, there will be little need for additional off-street spaces. If more or less space is available at the curb, less or more space will be needed off-street, and so on.

If additional curb parking restrictions are imposed, spaces off-street will be required to compensate for such loss. If a change is made from single to parallel parking at the curb, an altered demand for off-street spaces will result. When a parking lot off-street is withdrawn from such use because its owner finds it more profitable to build an office building thereon, an additional burden is imposed on the remaining parking facilities.

Parking facilities must be appropriately placed in relation to the major parking generators. Studies of the central core area of a large number of cities reveal that, to be effective, off-street parking accommodations must be established within a prescribed walking distance

from the generators. Parking facilities cannot be established just anywhere. They must be so planned in their location and design features as to fulfill the needs. From this point of view alone it is essential that the system mechanism be used.

In this respect, there is a close analogy between such parking facilities and the more important systems of highways—the National System of Interstate Highways, the Federal-aid-Highway System, and others—all of which are justified largely because of the concentration of traffic on their routes. Parking facilities, whether curb or off-street, need to be supplied in pin-point locations if they are to serve the generators of parking demand most adequately.

## Overall Urban Planning

The system concept also is consistent with overall urban planning. It should be quite obvious that the provision of parking facilities—or any other public improvement for that matter—cannot and should not be made in a vacuum. Rather, to be of maximum utility, parking facilities in their design and locational features, should be reconciled with overall master or official plans of the urban community. If such do not exist, they could be related in so far as possible to the city structure and its functioning as they now exist and to the other major public and private developments that are likely to take place therein.

The functional or operational significance of the system device is intimately related, of course, to its physical aspects. But it goes beyond that. Curb parking facilities best serve certain types of motorist-parkers—short-time parkers and shoppers. Off-street parking accommodations may serve other classes, including long-time parkers and workers. There are variations even within categories. Some curb parking should be unlimited; some restricted to two hours which might be adequate for shoppers; others to one hour, appropriate for a visit to the doctor; or even a half hour or fifteen minutes, adequate for a quick visit to the bank or post office.

In short, a parking facility should serve that function for which it is inherently best suited, a principle derived from transportation development. The system device must be employed before this principle can be applied successfully, so that a given facility is used

most efficiently. Comparative hourly rates for parking, posted periods for parking, and other restrictions and permissions are the tools which can be used to effectuate this principle.

Another operational element involved is the integration of requirements for the *parking* of vehicles with requirements for the *movement* of vehicles, especially on streets in the central business cores of municipalities. Studies of highway capacity in urban areas reveal that capacity volumes on downtown streets where parking is permitted are approximately 55 percent, on the average, of those observed where parking is prohibited.[1] Where all parking accommodations are integrated into a single whole, and that whole is related to highway transportation, it may be much easier than otherwise to preserve the capacity of a highway without imparing the availability of parking space. This can be accomplished by restricting curb parking on narrow and high-capacity streets; by permitting such parking where there is little interference with street capacity; by providing off-street accommodations where parking space is lacking, and so on.

Other functional features of parking facilities, both curb and off-street, can be satisfactorily adjusted in the public interest under the system machinery: the relative capacities of the facilities; the optimum rate of discharge of vehicles from such facilities as determined by the capacity of the adjoining streets to absorb the load, and the relief of traffic congestion by the provision of facilities in appropriate locations.

### Financial and Economic Aspects

The system mechanism is particularly significant because of its financial features. For all financial purposes all facilities are pooled into a single system. That means that all revenues from curb and off-street parking meters, parking lots, garages, buildings, and all equipment and accessories used in connection therewith, are placed in a common fund. Likewise, all costs, expenses, or outlays made for such facilities may be derived from the same common sources. If the

[1] In intermediate areas, the curb parking causes an average reduction in capacity of about 35 percent. In outlying areas, street capacity is generally unimpaired by vehicles parking or unparking. *Highway Capacity Manual*, Bureau of Public Roads, 1950, page 78 et. seq.

system concept is completely adhered to, this would be as applicable to existing accommodations as it would be to new facilities acquired in the future.

The consequences are important. Investment bankers are pretty well agreed now that revenue bonds are far more saleable—and saleable at lower rates—if secured by the combined revenues of curb parking meters and off-street accommodations, than if confined to the latter alone. Why this should be so is hardly baffling. Curb parking meters have already demonstrated their revenue-producing capacity; their income is both reliable and consistent. In contrast, the revenue possibilites of an off-street facility of ambitious proportions may be difficult to forecast accurately, and the character of the "beast" is somewhat different. Little wonder, therefore, that a revenue bond supported by both these sources of revenue enjoys a far greater acceptability in financial circles than one not so buttressed.

The system idea in its financial implications has other advantages. Frequently one or two or more off-street facilities may be completely self-liquidating, while one or two of their "weak sisters" may not be so. Yet it is important that the latter accommodations be supplied, as well as the former. If all of these facilities are bound together on a system basis, the chain of facilities as a whole may be self-liquidating and thus its financial soundness enhanced.

As so conceived, this system concept has its counterpart in the highway field, where the system notion is now firmly entrenched and has been ever since the beginning of the Federal-aid highway program. We have a Federal-aid highway system, the National System of Interstate Highways, state highway systems, secondary systems, urban systems, county systems, etc. In fact, it has been frequently asserted that the substantial progress achieved as a result of Federal-aid highway expenditures is due in large part to the insistence that such expenditure be made on a system basis.

The integration of curb and off-street parking facilities also has some economic ramifications. Unless the system principle is applied, the rate structure of off-street parking facilities and the scale of curb parking meter fees may provide an incongruous economic situation: In most cities of the United States, the parker-motorist can park for

five cents an hour at the curb in the central areas if he should be so fortunate as to find a vacant space; yet if he should be constrained by the need to park his vehicle to seek an off-street facility right at hand, he would have to pay 35 or 40 or even 50 cents for that hour of parking.

It may be that this seeming incongruity is the result of too high off-street rates and too low curb parking fees. Notwithstanding, such a situation might more easily be remedied where all parking facilities, curb and off-street, are considered as strands of a single whole in their financial and economic aspects as well as in their physical and functional characteristics.

## Legislative and Judicial Aspects

The legal aspect of the system idea has two elements, legislative and judicial. The developments in both areas are significant.

The system device is now authorized in at least eight states in a manner outlined in Table 1. In addition, it may well be that the system concept is authorized by legal implication in the statutes of at least fifteen other jurisdictions, indicated in Table 2. This may follow from authorizations to establish off-street parking facilities and to finance them in designated ways, and to use net parking meter revenues for off-street accommodations. Because of this statutory background, judicial contests on the subject in these states are likely to be more favorably resolved than in other states, following the precedents already established.

Table 1.

STATE LEGISLATIVE AUTHORIZATIONS FOR PARKING SYSTEMS, INTEGRATING CURB AND OFF-STREET AUTOMOBILE PARKING FACILITIES

| *State* | *Provisions* |
|---|---|
| FLORIDA | City of Orlando Parking Commission is created for purpose of conducting necessary research and planning, designing, and locating facilities; for maintaining current data leading to provision of a permanent coordinated system of parking facilities and to efficient operation thereof. |

| *State* | *Provisions* |
|---|---|
| ILLINOIS | The Illinois State Supreme Court recently held that the City of Kankakee (Poole v. City of Kankakee, 94 N. W. (2d) 416, 1950), under the authority of Article 52.1–1 et seq. of the Illinois Rev. Stat. 1949, could conceive of its parking facilities, both on-street and off-street, as a system of parking facilities, for purposes of their financing and establishment. |
| MARYLAND | To constitute Silver Spring Business District into a special tax area for purpose of levying and collecting a special tax on real and personal property therein and to acquire sites or improvements necessary for providing an adequate system of county-owned off-street parking lots; to maintain and operate such system; to install parking meters, charge parking meter fees, and fees for use of parking lots, and use the revenues therefrom for improvement, maintenance and operation of parking sites; and to issue bonds. |
| MICHIGAN | According to an important Michigan Supreme Court decision (Parr v. Ladd, 36 N. W. (2d) 157, 1949) the power of the Village of Wayne, Michigan, to acquire, own, establish, and maintain a municipal automobile parking system has both constitutional and statutory authority. The main issue of the case was whether a municipal parking system such as that contemplated, combining all automobile parking facilities, both curb and off-street, was a public improvement within the scope of The Revenue Bond Act of 1933, as amended. The high court said that it was. |
| PENNSYLVANIA | Parking Authority Law, authorizing cities of first, second, second A, and third classes to establish parking authorities; to empower such authorities to plan, finance, establish and operate a permanent coordinated system of parking facilities; to borrow money and issue bonds therefor. |
| TENNESSEE | City of Knoxville parking authority is created with power to conduct research and establish a coordinated system of parking facilities; to collect charges for use of facilities; to borrow money, issue bonds, condemn land; enter into contract, and do all other things necessary to carry out powers granted it. |
| VIRGINIA | Parking lots in sanitary districts. After the creation of a sanitary district in any county, board of supervisors are |

| *State* | *Provisions* |
|---|---|
| | authorized to establish parking lots systems, to provide for their operation and maintenance. |
| WISCONSIN | PARKING SYSTEMS LAW. To authorize any city or village to purchase, acquire, construct, extend, improve, conduct, and operate a municipal parking system, including parking lots, parking meters, and other parking facilities, upon its public streets or public grounds, and to issue mortgage bonds to finance same. |

Table 2.

STATES WHICH, BY LEGAL IMPLICATION, MAY BE AUTHORIZED TO ESTABLISH SYSTEMS OF AUTOMOBILE PARKING FACILITIES, CURB AND OFF-STREET

| *State* | *Provisions*[1] |
|---|---|
| ARKANSAS | Parking authority act for cities and towns. |
| CALIFORNIA | Vehicle Parking District Act of 1943.<br>Parking Law of 1949.<br>City of Fresno charter amendment for parking facilities.<br>City of Sacramento charter amendment for parking facilities. |
| CONNECTICUT | City of Bristol charter amendment for off-street parking facilities.<br>Town of Greenwich—public parking areas.<br>Town of Stamford parking facilities.<br>City of Waterbury—off-street parking facilities. |
| DISTRICT OF COLUMBIA | D. C. Motor Vehicle Parking Act of 1942. |
| FLORIDA | City of Coral Gables—off-street parking facilities.<br>City of Dania, charter authorization for parking facilities.<br>City of Jacksonville, parking facilities.<br>City of Miami Beach—charter amendment for parking facilities.<br>City of St. Petersburg—parking facilities.<br>City of Tallahasse—charter amendment for parking facilities.<br>City of West Palm Beach—municipal facility authorized. |

[1] Each listing represents a separate state statute.

| *State* | *Provisions* |
|---|---|
| ILLINOIS | Establishment of parking facilities by any municipality. |
| INDIANA | Parking facilities for first class cities.<br>Parking facilities for second class cities. |
| IOWA | Municipal parking lots. |
| KANSAS | Off-street parking facilities in cities of first and second class. |
| MAINE | Use of parking meter revenue to establish parking facilities in city or town.<br>City of Augusta—Augusta Parking District. |
| MASSACHUSETTS | Use of parking meter receipts to provide parking facilities.<br>City of Springfield—use of lands for parking. |
| MINNESOTA | Parking facilities for certain home rule cities of first class. |
| NEW HAMPSHIRE | Cities and towns authorized to use parking meter revenues to establish parking facilities.<br>Town of Exeter—can use parking meters to establish parking facilities. |
| NEW YORK | Binghamton Parking Authority Act.<br>Elmira Parking Authority Act.<br>New York City Parking Authority Act.<br>City of Syracuse Parking Authority Act. |
| OREGON | Parking facilities for any city or town. |
| SOUTH DAKOTA | Municipal parking facilities for any municipality. |

An analysis of the nature of some of these state laws or the local ordinances enacted pursuant thereto, might be revealing. The primary purpose of establishing a system of parking facilities is aptly stated in the recent ordinance of Grand Rapids, Michigan:[2]

". . . to effectuate and properly regulate and control parking in the City and provide necessary off-street public parking facilities to make such regulation and control effective, it is necessary and expedient that automobile parking facilities owned or operated by the City of Grand Rapids including specifically all street parking facilities where parking meters are now located, for the purpose of limiting parking, and the municipal parking facilities to be acquired for off-street public parking purposes, be combined into a single auto-

[2] Ordinance number 1284, approved June 26, 1950, amended July 17, 1950.

mobile parking system to be known as the City of Grand Rapids Automobile Parking System and operated as a separate function of the City of Grand Rapids under the general supervision and control of the Automobile Parking Authority of said City, or such other municipal agency or office as may be hereafter designated by the City Commission."

The ordinance further authorizes the acquisition and construction of designated parking structures; all revenues from any facilities, curb or off-street, are deemed to constitute revenues of the entire system; negotiable revenue bonds in the amount of $1,600,000 are authorized, said bonds to bear interest at not to exceed 3½ percent per annum; a statutory first lien upon the whole of the net revenues of the system is created to secure the payment of the bonds; the acquisition, construction, and operation of the system are placed under the supervision of the Grand Rapids Automobile Parking Authority, and initial parking rates are designated.

One of the earliest ordinances of this nature in Michigan is that of the Village of Wayne. The following is a significant excerpt:[3]

"From and after the effective date of this Ordinance, all automobile parking facilities owned and/or operated by said village for the benefit of the public in the control and regulation of all public parking therein, either on street or off street, shall be maintained and operated by the village as one separate municipal system to be known as the AUTOMOBILE PARKING SYSTEM, which shall include all parking meters, parking lots, buildings, facilities, equipment or accessories used or useful in connection therewith, either acquired under the provisions of this Ordinance, or subsequently acquired for said system."

Local laws similar to these have been enacted in other Michigan cities including Saginaw,[4] Ann Arbor,[5] Highland Park,[6] Royal Oak[7] and others.

The *Parking Systems* statute of Wisconsin is short, but contains important elements.[8] Under its terms any city or village, without the necessity of a referendum, may acquire, construct, improve, or

[3] Village of Wayne Ordinance number 113, 1947.

[4] Ordinance number D–161, enacted September 7, 1948.

[5] Ordinance number 83, passed August 18, 1947, amended November 3 and December 1, 1947.

[6] Ordinance numbers 689 and 690, adopted May 17, 1950 and August 7, 1950, respectively.

[7] Ordinance number 558 and 594, approved December 20, 1948, and January 9, 1950, respectively.

[8] Wisconsin Statutes, 1949, Section 66.079, page 1011.

operate a municipal parking system. Mortgage bonds may be issued to finance such facilities. Both curb and off-street parking facilities are involved.

State enabling and local executing legislation is important, but in itself is not enough. Endorsement by the judiciary is indispensable. What is the present attitude of the courts toward the system idea, insofar as that attitude has become apparent?

A milestone in judicial thinking, and perhaps the leading case on the subject is PARR versus LADD.[9] The Village of Wayne, Michigan, determined, by an appropriate ordinance referred to in previous paragraphs, to meet its parking needs by the establishment of a complete municipal parking *system,* to include parking meters, parking lots and other facilities. Revenue bonds, secured by the combined revenues of curb parking meters and parking lots, were to be issued to finance the costs of acquiring all such facilities. In PARR VS. LADD, the Michigan Supreme Court fully establishes the power of Michigan cities and villages to foster a complete, unified system of parking facilities including curb parking meters and off-street accommodations, financed by self-liquidating bonds secured by a lien on the combined revenues of all facilities.[10]

[9] 323 Mich. 592, 36 N.W. (2d) 157 (1949).

[10] This conclusion of the Michigan high court was reached in ruling upon the five issues in the case, as follows:

(1) Is a public parking lot for the use of which rates are charged a public purpose for which revenue bonds of the Village can be issued?

(2) Is the combination of on-street and off-street parking facilities a public improvement within the definition of that term in Act 94, Public Acts of Michigan, 1933, as amended?

(3) Has the Village power to pledge the net revenues of existing parking meters for the purchase of an off-street parking lot as a part of a unified parking system including said parking meters, parking lot and any other automobile parking facilities?

(4) Has the Village the power to pledge itself, as required by said Ordinance and Act 94, Public Acts of Michigan, 1933, as amended, to maintain parking meters on its streets and charge rates or fees for the use of parking space thereon until said bonds are retired?

(5) Does the provision of Act 94, Public Acts of Michigan, 1933, authorizing the appointment of a receiver to administer and operate such parking facilities and to fix rates for the use thereof under the direction of the court violate the Constitution of the State of Michigan in granting a public utility franchise without a vote of the electors and in imposing administrative duties on the courts?

All five of the propounded questions were answered by the Court in favor of the proposed program of parking facilities and the power to issue bonds therefor.

*Humbard Studios, Temple, Texas*

A metered parking lot in Temple, Texas. Different kinds of facilities may be necessary to satisfy varying requirements.

Lack of off-street parking facilities in this area has led to curb parking on both sides of the street.

Note the orderly arrangement of the parked vehicles, the huge capacity of the facility, the adequacy of the access and manoeuvering areas.

A cross-section of Detroit, Michigan. These separate parking facilities need to be integrated functionally to do the best job.

*Art Streib Studio, Los Angeles, California*

A spiral parking garage in Los Angeles. Off-street parking facilities of this kind are needed in many urban areas.

Where the elements of the system combined into an integral whole bear a reasonable relation to each other, its legality can hardly be questioned. This seems to have been the Court's view in two Michigan cases relied upon by the plaintiffs in the PARR vs. LADD case. In one, a municipal harbor and park development, comprising a harbor and yacht basin, auditorium, casino, bath house, museum, storage yard for yachts and boats, and other park and recreational facilities were successfully financed by revenue bonds in much the same way that the Village of Wayne sought to finance its system of parking facilities.[11] In another case, the city of Garden sought to combine water and sewer systems into one unit; the legality of the issuance of Water Supply and Sewage Disposal System Revenue Bonds to construct a sewage system was sustained.[12]

Another significant recent case which sanctions the system concept with respect to parking facilities is POOLE versus CITY OF KANKAKEE.[13] The Illinois Supreme Court upheld the legality of an authorization for "Motor Vehicle Parking System Revenue Bonds," in the following terms:

> ". . . Considering the Parking Act as a whole, it is apparent that the legislature had the entire parking system of a city under consideration and not just the separate facilities which would be acquired. To say that the parking system should be broken down into isolated parts for financing and disposal of revenue is inconsistent with the public purpose of the act, i.e., the orderly control and regulation of traffic. The language employed indicates the legislature intended that, where necessary, a city could, within its discretion, pledge the revenues from 'any or all' of its parking facilities for the purpose of maintaining, extending or improving the overall uniform parking system."

There are, of course, a number of cases upholding the right of municipalities to issue revenue bonds payable from revenues of both off-street and on-street parking facilities, which is the essence of the system principle, as in the case of STATE OF FLORIDA versus CITY OF MIAMI BEACH.[14]

11 Gilbert v. Traverse City, 267 Mich. 257, 255 N. W. 585 (1934)
12 Holland v. Heavlin, 299 Mich. 465, 300 N. W. 777 (1941)
13 406 Ill. 521, 94 N. W. (2d) 416 (1950)
14 47 So. (2d) 865 (1950).

### Accomplishment

The system notion is of course too new in its conception and application to have been responsible as yet for any extraordinary accomplishment. But in a few municipalities where this tool has been utilized, especially in Michigan, evidence of its potentialities is beginning to appear.

Take Grand Rapids, Michigan, for example. A survey of parking needs revealed that a deficiency of approximately 6,000 spaces exists in the central business district. The initial program of the Grand Rapids Automobile Parking Authority comprises three parking structures totaling 765 spaces. As of February 1951, $800,000 in revenue bonds had been sold at an interest rate of 2.33 percent, providing for a five-level structure and the site for a second project. The first project involving 320 parking spaces was dedicated September 1, 1951. The on-street parking accommodations, part of the system of facilities, have yielded an average of $114,000 net revenues annually.

Lansing, Michigan also has made progress. A Parking Study Committee estimated the deficiency of parking spaces to be 7,644 in the central business district. Ten sites were designated for development, so located that practically all property in the district would be within one and a half blocks from one of them. At least five of these have been acquired, developed, and placed in operation, totaling 534 spaces. The remaining properties are to be acquired. A proposal for the construction of a half-million dollar, four-story municipal parking structure in the central area is being investigated by the city council.

Royal Oak, Michigan provides further illustration. Four parking facilities have been established since the inception of the Royal Oak Parking System Advisory Committee. The capacities are 135, 306, 100, and 45. The city issued $325,000 of Automobile Parking System Revenue Bonds in 1950 to finance two of these off-street facilities and also some additional curb parking meters.

Then there is the case of Ann Arbor, Michigan. This progressive community has established a system of parking facilities which includes curb metered parking spaces, a three-deck garage costing

$314,727, and six parking lots, four of which were acquired at an aggregate cost of $240,926. It is financed by bonds and revenues from all the facilities.

Michigan is not the only state that illustrates application of the system concept. A Municipal Parking System Fund has been created in Waukesha, Wisconsin and $200,000 in revenue bonds have been authorized. Bonds worth $70,000 have already been issued for the purchase of additional parking meters and four parcels of land for off-street parking in the business district.

Likewise, the city of Madison, Wisconsin has authorized the issuance of $400,000 in revenue bonds to purchase off-street parking areas under the management of a public body known as the Parking System Utility.

Recently two other cities have issued revenue bonds to finance an automobile parking system—Kankakee, Illinois and Wyandotte, Michigan. The foregoing examples do not exhaust the list by any means.

### Commercial and Special-Purpose Parking Facilities

This monograph has discussed only *publicly-owned* parking accommodations either curb or off-street. There are at least two other kinds of off-street parking facilities in urban areas: *commercial* facilities provided by private enterprise, open to public use for a fee, and *special-purpose* facilities provided for restricted use in connection with particular businesses, hotels, theaters, housing developments, and the like. One might well ask what relationship these categories of parking facilities bear to the system concept.

Strictly speaking, the system idea is necessarily confined to public parking accommodations since it is these facilities over which public authority can exercise substantial financial and physical control. But in a larger sense even *commercial* and *special-purpose* facilities are taken into account under the system principle. For example, if commercial accommodations in a particular area are adequate to meet its needs, certainly it would be illogical for public authority to supply any additional facilities. In fact, in the design of the system, particular recognition must necessarily be given to the aggregate of all

parking facilities available, regardless of their sponsorship or public or private character.

In short, the system concept can operate effectively only in those areas where a parking demand continues to be unsatisfied, where private enterprise has not supplied the necessary facilities, and where a legitimate area exists for public authority to make a contribution in the public interest.

## Essential Elements of a Parking System

Essential elements that comprise the conception of a system of parking facilities for a particular city can be summarized as follows:

1. A parking problem must exist. The system device is a solution to a condition of difficulty. It can be of assistance only if there is a deficiency of parking accommodations properly located and appropriately priced in their user costs.

2. The system mechanism must be authorized in its principal parts in state enabling legislation and in local executing ordinances. It need not necessarily be called the "system" idea, as long as its important characteristics are spelled out.

3. All parking facilities under public control must be pooled, i.e., curb parking spaces and parking meters, off-street lots and garages and all other auxiliary structures and facilities. The integration must be physical and functional.

4. All financing and revenue operations must be pooled. All revenues from both curb and off-street accommodations must be put into a common fund which can be used to support revenue bonds or other obligations covering any part or the whole of the system.

5. It is presumed that the system as a whole is self-liquidating in character, considering all contributions to be made from any source and all financial demands that could be made upon the resources of the system.

6. Management of the establishment, acquisition, construction, operation and maintenance of the system must be lodged in a responsible public body specially qualified for the purpose.

7. Finally, the public needs for parking facilities must be so urgent, the authorizing legislation so soundly conceived, the physical and operational plan so reasonable, and the financing proposals so equitable, that the judiciary will approve of the whole scheme as legal and constitutional.

Every local governmental unit concerned with its parking problem should examine thoughtfully this system idea, regardless of

the status of the development of its parking program. Its potentialities are many.

## Conclusion

The development of parking facilities in the urbanized areas of the United States is now ripe for the application of the system concept. All the elements necessary for a successful resolution of parking difficulties appear to be available. What remains to be done apparently is to put them together properly. The system idea seems to be one of the most powerful of catalysts that could unite the strands into a single whole.

It makes sense from many different points of view. It assists in the proper location and design of parking facilities, relating the physical elements of curb and off-street facilities. It provides for a maximum of efficiency in its functional or operational aspects. It supplies an attractive underpinning of security that is most desirable from a financial point of view. It is consistent with sound official and overall master planning of municipalities. It can be provided by a sound statutory basis, and it is acceptable from a judicial point of view.

# Scientific Toll Collection: New Traffic Engineering Problem

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ON THE 20th anniversary of the George Washington Bridge, the Port of New York Authority announced that 200,811,687 vehicles had paid tolls of $109,866,465 in the twenty-year period. It was further evidence that the collection of tolls for using the nation's hundreds of bridges, tunnels, turnpikes and causeways, had become an important traffic engineering problem.

No figures from an official agency give the number of tolls collected throughout the United States. The best estimate comes from figures compiled by the American Bridge, Tunnel and Turnpike Association, Inc., that last year tolls were collected at the rate of $500,000 a day, nearly $185,000,000 during the year. That would mean approximately half a billion separate transactions annually by which motorists paid individual toll fees of from five cents to over $10.

With more and more toll facilities opened every year, and with the growing trend toward using tolls to finance traffic facilities, the number of transactions will undoubtedly increase considerably during the next decade. Legislative proposals for either new, broadened

authority, or consideration of toll projects, were introduced in forty-four state legislatures during 1951. New York State voters have approved pledging their State's credit for $500,000,000 in bonds, to build the 535-mile New York State Thruway, scheduled for completion in 1954. Already, the 118-mile New Jersey Turnpike is collecting tolls of approximately $45,000 a day, and with traffic now running 200 per cent above expectations, according to Turnpike Authority Chairman Paul L. Troast, the daily receipts will undoubtedly exceed $50,000 before the summer is over.

### A Vital Branch of Banking

This makes toll collection a source of concern to toll facility officials, who know the problem of safeguarding the receipts and protecting bondholders. They know that in effect they are running a vital branch of a banking business, and as such they need modern banking methods for protection. This was frankly stated by the Committee on Tolls of the American Bridge, Tunnel and Turnpike Association, Inc. to the organization's 1950 annual meeting in Boston:

". . . Here is a subject of first importance, which should be under constant consideration and exploration toward betterment of all engaged in the toll business wherein the functions are comparable to those of our finest banking institutions. In fairness to your staff, your stockholders and your public, you should guide, guard and preserve the high integrity of your organization, using the ultimate in protection for all."

When this Committee reported that some toll facilities had no equipment to register tolls, they meant that these facilities, a few of them built at a cost of a million dollars or more, were still using the "cigar box" method. This dangerous system employs a collection method with no means of checking the accuracy of the vehicle count or the honesty of the collectors.

The first scientific effort to register and record vehicles using a toll facility was made in 1928 when the Ambassador Bridge was opened between Detroit and Canada. Here an electric eye device was installed to count the cars as they went by the toll booth. The experiment was a failure because the toll collectors found it simple to allow

flying newspapers, dirty rags and mud to interfere with the beam.

This failure prompted Ben Cooper, the engineer who had developed the idea of using the electric eye for toll collecting, to seek a fool-proof system for counting vehicles. His efforts succeeded when after fourteen months of research he discovered the principle of using vehicles' rolling motion over a treadle imbedded in the roadway to record its progress through a toll lane. The treadle was engineered so it could not record a pedestrian's walking over it, nor respond to a weight. Only rolling motion of a vehicle could activate it.

### Rolling Motion the Basis

The rolling motion principle is the basis of the toll collection system on the George Washington Bridge, where it was first used. It is also part of the systems used on the New Jersey Turnpike, the Mystic River Bridge, the World's Fair Parking Fields, the Golden Gate Bridge, the Delaware Memorial Bridge, the Pennsylvania Turnpike, the Lincoln Tunnel, the Brooklyn-Battery Tunnel, the Triboro Bridge and scores of other toll facilities.

An example of what a modern toll collection system can do is the Laredo Bridge which crosses the Rio Grande into Mexico. When the bridge opened about fifteen years ago, the "cigar box" toll collection system was used. Bridge officials were puzzled when toll transactions fell far below the traffic counts of the Immigration & Customs Service. They ordered the rolling motion system installed.

One month after it was in effect, Laredo Bridge toll collections jumped $4,800 above the previous month of the "cigar box" method. In three months, the increased receipts more than paid for the modern installation.

Hand coin machines, which are used on some busy toll facilities, also are in the "cigar box" category. These machines, which make it impossible to give an accurate count of the receipts, can be found on a crossing as important as the Philadelphia-Camden Bridge.

Collection of tolls for crossing a bridge, going through a tunnel, or using a parking space is a relatively simple process mechanically and procedurally. There is a single schedule of tolls, usually based on the number of the vehicle's axles. As the vehicle passes the toll

collector's booth, the motorist pays the toll and drives off, rolling his vehicle over the treadle as he leaves the toll booth.

The treadle counts and registers the number of axles. This information is recorded and printed on tape in a locked device remotely located, usually in the toll plaza supervisor's booth. This printed information must then tally with the tolls accepted by the collector and registered by him on a device similar to the ordinary cash register. This phase of the transaction is also remotely recorded and tape-printed. At the end of a tour of duty, the money registered by the collector and the record of the vehicles passing over the treadle must tally precisely.

In some instances, as at the George Washington Bridge and the Lincoln Tunnel, the class of toll collected by the toll guard is illuminated by number above the toll lane. This gives supervisors an opportunity to check any lane's operation from a distance.

### The Complicated Turnpike Problem

What then of the problem of collecting tolls on a turnpike or thruway, where it is possible to drive as many as thirty different distances in six different classes of vehicles? Despite the complexity of this problem, a solution has been found for each special situation. That includes the New Jersey Turnpike with its eighty-three toll lanes at seventeen interchanges, which makes it the largest single toll collection installation ever constructed.

Toll collection on the New Jersey Turnpike is a triumph of science and engineering know-how. Every modern development—the majority from Cooper's research—makes the New Jersey system the best in the United States. Engineers planned the eighty-three toll lanes to accelerate the movement of traffic through the interchanges with only most necessary stops—to receive a toll card upon entering, and to pay a toll upon leaving.

Provision had been made for increasing the number of toll lanes to keep pace with the growth of the traffic load. And it was fortunate that this had been done, because in less than three months after the entire Turnpike's opening, traffic loads jumped from the 1952 forecast into the estimates for the year 1957! Even the foresighted engi-

neers, who had provided for the extra lanes, were left a little breathless as traffic in and out the turnpike backed up for miles, when the toll facilities just couldn't handle a load that was five years ahead of its time. However, in a matter of days contracts for additional toll facilities were let, and construction began on twelve additional lanes and equipment. The engineers, frank to admit that even a total of ninety-five lanes may not be enough to handle peak summer traffic, are now at work figuring where perhaps another twelve toll lanes will be placed.

During the month of April, 1952 the total number of vehicles using the turnpike for each of the four weeks was 303,973, 323,656, 364,835, and 321,768 respectively. The average for the busiest week of that month was about 52,000 vehicles a day. Engineers had estimated that the daily average for the entire year would be 23,016. This means that the turnpike will net about $5,000,000 for 1952, instead of showing a loss of several thousand dollars.

As the motorist enters the New Jersey Turnpike at any one of the seventeen present interchanges, he receives a toll ticket on which is printed the number and name of the entry interchange, and the class of vehicle—any one of six. Punched into the ticket are also a variety of holes that represent the same information. Before handing the ticket to the motorist, the toll guard validates the ticket in a machine, which stamps his number, the toll lane number, and the date and time of entry. The machine also registers and computes the number of cards validated.

As the motorist leaves the turnpike, he surrenders his ticket, and pays for the distance travelled. The cost of travel to each interchange from his point of entry is printed in a series of boxes on the face of the ticket.

When the toll collector at the exit picks up the ticket from the motorist, the collector checks the class of vehicle in the toll lane with the class of vehicle imprinted on the toll card. If these tally, he quickly notes the number of his interchange in one of the boxes on the ticket, collecting the toll printed under that number. He then cancels the ticket by inserting it in a machine that prints his number, his toll lane number, the date and the time. The machine also counts the number of cancellations.

### Checks and Double Checks

There are registering treadles at each entrance and exit lane on the New Jersey Turnpike. At the point of entry, the toll guard must account for every card he issues and validates. The number issued and validated must tally with the validating machine count and treadle count.

Since each axle of a vehicle is treadle registered, the collector must give a trailer truck with four axles a Class Six ticket. If he gave a two-axle passenger vehicle ticket to a Class Six truck, he would have to answer for his error. In addition, the toll collector at the exit point cannot accept a passenger vehicle toll, when his toll lane treadle is registering a four-axle trailer truck.

The opening and closing of any toll lane are registered and recorded in the New Jersey system. Before a toll lane is ready for operation, the collector must insert an identifying key notched with his identifying number in each of two machines, keeping the keys there until he completes his tour of duty. First, he must insert his key in the remote identifier device. This causes the remote recorder to take a print. Only after this print is made can the validating machine be set in operation with the second identifying key. The moment the print is taken, the lane is automatically opened, and a green traffic light shows in the canopy above the line. When the key is removed from the identifier machine, the traffic light shows red and the lane is closed.

As soon as the collector places his identifying key in the remote identifier device, his number, the previous total for the lane, and the date and time of opening the lane are automatically printed on a roll of tape. From then until he removes his identifying keys, every movement over the treadle in his lane is remotely tallied and charged against him. At the completion of his tour of duty, the toll guard's card count must tally with the validating machine count and with the treadle count.

For those toll guards who actually collect cash tolls at exit points, the number and class of cards collected must tally with the cancellation machine count and the treadle count. The amount of cash taken in must also tally with the tolls printed on the cancelled toll tickets.

Special Remington-Rand computing machines, responding to the holes punched on each toll card, make the final computations for each collector in a matter of minutes at the Turnpike's headquarters in New Brunswick.

The Taller & Cooper system provides for cases when a motorist backs up over the treadle for some reason, after passing over it and being counted in a forward direction. The remote register tape will count this reverse motion on a separate counter. There will then be forward direction. The reverse count therefore compensates for the two forward counts to give a correct net forward count of one.

The New Jersey system is tamper-proof. It is impossible for even a maintenance man to reach the system's mechanism without first using his identifying key in the registering mechanism. The moment his key is inserted, his identifying number is automatically recorded on tape. Should the counting mechanism be turned back, as was done on the New York subway system some years ago, this change will automatically be recorded on the tape, as will the time it occurred and the identifying number of the maintenance technician.

## Seven Reasons

To protect toll receipts, the New Jersey Turnpike Authority chose its collection system for seven reasons:

1. Responsibility for the entire control, accounting and statistical procedure is placed with one contractor.

2. Since toll booths, treadles and recording equipment are manufactured by the same contractor, installation costs are reduced.

3. The tabulating machines permit rapid and economical auditing of revenue, axles, transactions, and prepare statistical data by a comparatively simple procedure.

4. Only pedestrian-proof, tamper-proof treadles are used to assure accuracy of checking tolls, eliminating the possibility of false count by persons walking across the treadle, or tampering with the treadle to prevent counts.

5. Treadle equipment is jack-mounted for simplified maintenance. Defective units can be rapidly replaced with spare com-

ponents even by inexperienced, non-technical personnel, with minimum delay to traffic.

6. The transaction counter provides immediately a count of total traffic handled by the collector, and checks the number of tickets issued and collected, to prevent fraudulent handling of tickets.

7. The key identifying system is a permanent and tamper-proof record of all transactions handled by any single collector, and simplifies auditing, eliminates errors, and assures proper operation at all interchanges.

### Biggest Test to Come

The real test for any toll collection system will be the New York State Thruway. The 535-mile super-highway from New York to Buffalo will have approximately 100 interchanges. The problem facing Thruway officials will be to devise a fool-proof, tamper-proof toll collection system that will take care of (1) a wide variety of vehicles, (2) any one of which could travel between any two of about 100 different access points along the Thruway (3) and any one of which could be a cash toll, or (4) a vehicle bearing a Thruway permit plate, or (5) a vehicle having an authorized charge account. This system will be further complicated by four additional factors: (a) some tolls will be collected at the interchanges, (b) some at barrier points, while (c) a vehicle without a permit plate will pay the regular fee for the privilege of crossing the Thruway's Nyack Bridge across the Hudson, and (d) a permit plate vehicle will pay half the regular rate for crossing that bridge.

New York Thruway officials, just as did the New Jersey Turnpike Commission, are making careful engineering surveys of the problem, because they are intelligently aware that a fool-proof, tamper-proof toll collection system, protecting both government and bondholders, and winning the confidence and respect of the public, makes the best public relations any toll authority can have.

# Impounding in the Nation's Capital

JOHN J. AGNEW

*Inspector Agnew joined the Metropolitan Police Department of Washington, D. C. in 1924. He served five years as a foot patrolman and six years as a motorcycle patrolman. He was promoted to foot sergeant in 1935. Thereafter he served one year in a precinct, two and one-half years in charge of the Traffic Records and Collateral Office, and two years as assistant to the Executive Officer. In 1940, he became a lieutenant. In this rank, he served two years as supervising officer in a precinct; then five years as liaison officer with the Civil Service Commission, investigating and selecting applicants for appointment to the department. He was promoted to Captain in 1947. In 1951 he was assigned to command the Traffic Division. In March, 1951 he was promoted to Inspector and assigned to his present post, in Charge of Traffic.*

IS IT enough to "tag" the illegally parked car? The District of Columbia does not believe that it is. As long ago as May 21, 1935, the District adopted an Impounding Regulation designed to deal more adequately with this question.

Under that regulation, members of the Metropolitan Police Department were authorized to impound "any unattended vehicle found parked during prohibited hours between a safety zone or loading platform and the curb, or so as to obstruct the entrance to an alley, roadway or garage, or on any public highway upon which parking is prohibited between the hours of 8 A.M. and 9:30 A.M., 4 P.M. and 6 P.M., or 'at any time,' * * *."

The remainder of the impounding regulation cited police responsibility for notifying the owner of the impounded vehicle, and the procedure by which each owner might recover his property. As this portion of the regulation has remained substantially the same, it is not included here.

From this restrictive early regulation, Washington police, by properly functioning within its limitations, correctly interpreting its intent, and not abusing this police power, have developed public confidence to the point where later amendments make the regulation

now broader in scope, affording the police a better opportunity to serve the public interests. This present regulation provides that:

"Any unattended vehicle found parked in violation of any traffic regulation, except overtime parking of less than 18 hours, may be removed, conveyed, and impounded by or under the direction of a member or members of the Metropolitan Police force, either by towing the same or otherwise, to the police precinct station of the police precinct in which said vehicle was found, or to any other place designated by the Commissioners of the District of Columbia for that purpose.

"It shall be the duty of the police department to inform as soon as practicable the owner or other person in charge of an impounded vehicle or claiming the same, of the nature and circumstances of the traffic violation herein provided for, and for which, or on account of which such vehicle was impounded.

"The owner of such impounded vehicle, or other duly authorized person, shall be permitted to repossess the same upon the posting of the collateral required for his appearance in the Municipal Court (Criminal Division) to answer for said violation."

The intent is clear; the regulation permits impounding any vehicle illegally parked where its physical presence should be removed to facilitate traffic. It does not permit the removal of vehicles parked in violation of "overtime" parking, as such removal would not create an additional traffic flow lane, but would only make space for another motorist to park.

Attention is directed to the clause, "either by towing the same or otherwise", in the present regulation. "Otherwise", as used here, takes care of situations where the illegally parked vehicle has been left with the keys in the ignition or motor running unattended, permitting the officer to drive it to the desired location without awaiting the arrival of the departmental crane.

In addition to the aforementioned Impounding Regulation, Public Law 401—77th Congress, Chapter 4—2nd Session, H.R. 6163, provides for the impoundage of vehicles parked, whether attended or not, on public or private property in the District of Columbia, other than public highways, without the consent of the owner of such public or private property. It further states that in any prosecution under this section, proof that a vehicle was parked, stored, or left on public or private property shall be prima facie evidence

that the vehicle was so parked, stored, or left without the consent of the owner of such public or private property, thereby shifting the burden of proof upon the defendant to prove that he did have the consent of the owner of the affected property.

On January 15, 1942, the effective date of Public Law 401, a Parking Authority was established to allocate the use of city-owned property—other than public highways—as parking spaces on a rental basis. Public Law 401 permitted the impounding of unauthorized vehicles parked in these assigned spaces.

## Establishment of Policy

With these legislative tools at our disposal, our next step was to determine how they could be used most effectively.

Washington's complex traffic problem clearly demonstrated the necessity of focusing this activity on our downtown area. Most cities have considerable congestion within the area known as the business district. This is true in the District of Columbia. Washington's problem increases with the thousands of government employees driving to work within the Federal Triangle, immediately south of the business district.

We concentrated our impounding efforts on illegally parked cars within this area and adjacent streets, during the morning and evening rush hours. Where streets are being used to their maximum capacity by flow traffic, the illegal parking of one vehicle within a block reduces the traversable portion of the street by one lane. So we determined not to allow the selfish interests of one individual to penalize the majority. Impounding also eliminates the accident possibility caused when curb-lane traffic is forced to merge with that of the adjacent lane.

Our decision to concentrate on this area resulted from analyses of motorist-behavior which proved that violations of this nature diminished the farther from the center of the city the motorist progressed.

The value of the impounding procedure is not limited to rush periods; it is useful at all times in the removal of parked cars obstructing intersections, stop signs, etc. That reduces an accident

FIGURE 1. Illegally parked cars and truck necessitate crane to free street for moving traffic.

FIGURE 2. Same street a few minutes after appearance of crane inspires removal of cars parked in violation.

FIGURE 3. Crane operator checks car brakes and gears before towing it to station.

potential. The value of impounding is further enhanced by affording a means of removing illegally parked vehicles from streets temporarily designated as "parade routes", or from streets whose full width is necessary for special events.

Washington, D. C., as the nation's Capital, becomes the scene for activities of national import; Presidential inaugurations, visits of foreign dignitaries, and so forth. All of these require the clearing of certain streets.

Emergency No-Parking signs, stating the hour after which no vehicle shall be parked, are posted well ahead of the streets' need. The event causing such posting is publicized beforehand, together with the locations of the designated storage streets to which vehicles in violation of such signs are to be towed.

This is the only instance where the impounded car is not towed to a police station, since the time involved to do so might prevent the completion of clearing the affected streets.

Responsibility of the police for damage to the car while in their custody will be discussed later, but it might be well to report here that complaints of this nature have been negligible.

### Mechanics of the Impounding Procedure

Before starting the impounding procedure, considerable thought must be given to development of the mechanics of impounding which will protect the interests of both the motorist and the municipal government. It is the practice in the District of Columbia to assign during the morning and evening rush periods a motorized officer—generally on motorcycle—to accompany the civilian operator of the towing crane. This officer patrols roadways where experience has shown his presence to be most needed, and directs the actions of the crane operator.

When he sees an automobile illegally parked he instructs the operator to impound the car, and fills in the required information on a Traffic Violation Notice, the original of which accompanies the car to the precinct station where it is given to the station clerk for his record. Any damage to the car existing at the time the police take possession is noted and made a matter of record. This record would

show: condition of body, condition of chassis, number and condition of tires, broken or cracked windows, in fact the exact condition of the car as nearly as could be ascertained.

This record will definitely establish responsibility for any subsequent damage, and will prevent false claims of damage to the car while in police custody.

Frequently when the crane enters a block in which several cars are parked illegally—before the operator can hoist the first vehicle—most of the drivers of these cars will appear and accept their ticket and move, thereby eliminating the necessity of towing these cars in. The appearance of the crane has considerable psychological effect on the operators of illegally parked cars, many of whom would leave their cars parked in violation if it only meant getting a ticket. However, they seem to have no desire for the trip to the station to redeem it.

Figures 1 and 2 illustrate this point: No. 1 was taken shortly after the arrival of the crane, No. 2 was taken several minutes later. The truck in the background was moved less than one minute after No. 2 was taken, which then permitted full use of the street for moving traffic. Figure 3 shows the operator of the crane checking the car prior to towing it to the station. He is making certain that the emergency brake is off and the car not in gear.

After this final check, the vehicle is towed to the nearest police station and placed in an enclosed lot for safekeeping. Before leaving the vehicle the operator of the crane will inspect the vehicle, note all damage and report such information to the station clerk.

When an automobile is brought to a station, it is the responsibility of the officer who takes the vehicle in charge to search it thoroughly and remove all property therefrom. He is held responsible for seeing that all such property is recorded and properly safeguarded.

When property is found in a vehicle, separate entry is made on PD 82, (receipt book) and receipt must be signed by the owner of such property in the same manner in which he signs for his vehicle. (Washington's being a tourists' mecca and the amount of luggage normally carried in cars by sightseers make the safeguarding of such property an important and time-consuming duty.)

The impounding officer is further required to notify the teletype

room, giving the year, make, model and tag number of the vehicle, and the reason it was impounded. Upon receipt of this message, the teletype clerk must immediately check all current teletype messages and stolen automobile records in order that appropriate action may be taken in the event the impounded vehicle has been reported stolen.

In addition to the duties outlined above, the impounding officer must completely fill out PD 172—Figure 4, Report of Automobile in Possession of Police—making certain to itemize any damage to the vehicle, any missing accessories, or any property he may have removed from the vehicle. He is further charged with the responsibility during freezing weather or at periods of the year when radiators or motor blocks might freeze, of draining the water system of the car unless he has been informed by the owner or driver of the vehicle, or has ascertained by inspection that there is a sufficient quantity of anti-freeze solution to insure no possibility of damage to the car by freezing. A notation as to what action was taken must be made on PD 172.

Immediately after delivery of PD 172 to the station clerk, the impounding officer must notify the licensee of record, if that information is available, that the vehicle has been impounded, the violation for which impounded, the unit to which the vehicle was taken and the procedure necessary to obtain the release of the vehicle. If unable to notify the owner immediately, the station clerk then reports the facts of the impounding to the Communications and Records Bureau by teletype in order that any inquiries about the vehicle at units other than the one holding the car may be properly answered.

### Release of Car

Impounded vehicles are held until the owner or operator shall call and deposit collateral on the charge for which the vehicle was impounded. The amount of collateral is established by the Minimum Collateral List, which shows the amount to be exacted for all traffic violations. It was issued by the Presiding Judge of the Municipal Court for the District of Columbia. Commanding officers of police precincts are empowered to raise the collateral—not to exceed $25 for each offense—depending on the seriousness of the nature of the

charge. Usually the minimum collateral is sufficient; however, in certain circumstances a higher collateral is required:

1. Where the offense is considered a "flagrant violation."
2. Where the offender is shown to be a "repeater" who has clearly indicated his complete disregard for traffic regulations pertaining to parking, and by his actions demonstrated that the amount of collateral previously exacted was inadequate.

The Traffic Division maintains an "out-of-town" list, filed numerically by license plate and state, showing all Traffic Violation Notices issued against vehicles whose owners or drivers have failed to honor such notices. This list is checked at the time collateral is posted for the impounding offense to determine whether outstanding traffic tickets exist against the car being redeemed. At the same time the warrant file is searched for outstanding warrants against the person posting collateral. If either file reveals that the person posting collateral has failed to fulfill his obligations, he is required to dispose of all prior violations before he is permitted to repossess his vehicle.

The offender can at this time elect either to forfeit his collateral or to stand trial for his offense or offenses, as the case may be. After completion of his business with the collateral clerks, his vehicle and any property removed from it are returned to him upon his signing a receipt for such returned property.

In most instances the offender elects to forfeit his collateral. However, there are times when the repeater or flagrant violator, realizing that the collateral demand for his violation is higher than that he had normally posted for similar violation, has elected to appear at court and stand trial. In nearly all instances of this nature the Judges of the Court have imposed penalties in keeping with the seriousness of the offense.

### City Owned Cranes Used

The Police Department has four two-way radio-equipped cranes, all owned by the District Government, for use in impounding activities and related services. No privately-owned cranes are employed.

Two schools of thought exist as to whether an additional charge should be made to cover the cost of impounding. We find that our policy of setting collateral in the amount adequate to cover individual cases is sufficient. Nor is any storage charge imposed in instances where the owner of an impounded vehicle leaves his car in police custody for an extended time. Efforts are made to have him redeem his vehicle as soon as possible, but if he does not, there is still no further charge. Making no additional charge for the time the vehicle remains in police custody, nor for the cost of towing eliminates any claim that the impounding procedure is a revenue measure.

Nine civilian drivers who work a five-day week are employed to operate the cranes. After the rush periods when they accompany the motorized officer, they remain at the service shop subject to calls for similar impounding service, towing in recovered stolen vehicles, and removing disabled vehicles involved in accidents where the operator has been hospitalized and is unable to look out for his car. The cranes are also used in removing damaged vehicles from the roadway to the side of the street—where the owner is present and will later arrange for a garage to tow his car in for repairs—in order to clear the street of obstruction.

In addition to these duties, the crane operators are used in other capacities:

1. Mounting and repairing tires for departmental motorcycles, automobiles, and patrol wagons.
2. Checking and servicing the department's vehicular equipment for antifreeze during those months when this service is needed.
3. Checking speedometers on all vehicles owned by the department.
4. Installation of windshields on motorcycles, and removal of same, when desired.
5. General driver assignments as the department needs dictate.

With four cranes at the department's disposal, it is of course possible to put four cranes on the street at any hour their services are needed. However, the general availability of cranes by hours is as follows:

*Four cranes from 7:30 A.M. to 4:00 P.M. *Two cranes from 4 P.M. to 6:00 P.M. One crane from 6:00 P.M. to 7:30 A.M.

* Except on Saturdays and Sundays; on Saturdays, two cranes are in operation from 7:30

As an indication of the extent of services performed by the cranes, the activity record for the fiscal years ending June 30, 1948, and 1951 is cited:

| | *1948* | *1951* |
|---|---|---|
| Impounded vehicles | 2651 | 3151 |
| Accident calls | 1306 | 1162 |
| Stolen cars towed | 736 | 699 |
| Police business* | 1634 | 1692 |
| No service** | 906 | 1197 |
| Totals | 7233 | 7901 |

*Police business, as used here, would include calls to move unclaimed vehicles from precincts to the District Property Yard; also Item 5 under "duties of the crane operators." It further includes stationary assignments where the cranes are directed to a certain location near some special event for such duties as may be needed.

**No service includes calls for impounding service where the driver of the illegally parked vehicle appeared and either accepted a Traffic Violation Notice, or was taken to a police station prior to the crane's arrival. When this happens, the crane operator is notified by the radio dispatcher while en route to the point of call that his services are no longer needed. If there were no other demands for his services at the time, the dispatcher would direct him to return to the service shop.

It must be kept in mind that the number of vehicles impounded each year represents only a small percentage of the vehicles ticketed for illegal parking. They represent quality enforcement, however, when compared to tickets placed on illegally parked cars whose violation is not such as to warrant impounding.

### Factors That Influence Impounding Effort

The principal factor influencing our impounding effort is probably the city's growth, coupled with that of our neighboring states. The

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A.M. to 4:00 P.M., one from 4:00 P.M. to 6:00 P.M. Only one crane is available during the twenty-four hours on Sundays. (The United States Government employees work a five-day week with Saturdays and Sundays off, and as a result enforcement of the morning and evening rush periods is suspended because this curb space is not needed for moving traffic at that time.)

city of Washington, embracing 69.2 square miles in area of which 7.8 square miles are inland waterways, is located on the Potomac River between Maryland and Virginia. A 21 per cent increase in population during the last ten years now makes Washington the ninth ranking city in the country with 802,178 persons living within its boundaries. The increase in vehicle registration during the last eight years is represented by the same figure, 21 per cent.

These increases in population and vehicle registration in the District of Columbia do not present a true picture of the city's expanding vehicular traffic, as it is estimated that over 49 per cent of all vehicles daily using the District streets bear out-of-state tags. The population growth—with the resultant increase in vehicle registration—in our contiguous states has surpassed that of the District because of availability of land for home construction. Yet most of these out-of-state residents are, for all intents and purposes, actually as much a part of the District's traffic problem as though they lived within the city limits. Most of these persons work in the District and drive to and from work; many of them would use public transportation but for the fact that a considerable number of transit lines servicing these communities have been discontinued by the operating companies who claimed them to be non-profit propositions. Naturally this added vehicular traffic resulted in further restrictions on certain roadways, particularly during the morning and evening rush period. Reduced curb space for parked cars further extended the area where impounding service would be needed, and because of the limited number of cranes spread the impounding effect rather thin.

This is not intended as a blanket indictment of motorists from our adjoining states—many of whom honestly attempt to comply with District regulations—but it is a recognized fact that many are aware of our inability to serve warrants outside the District for violations committed here. Many believe that they can receive tickets for improper parking, ignore them, and never be brought to task for their violations. Unfortunately, in many instances this is true, a fact that helps to create a "let's take a chance" attitude. Another fact is that while these states do at times issue tabs to be attached to the previous year's plates, thereby allowing our "out-of-

town violator list" to remain of value, their issue of new complete tags at other years voids our list because of the license number change.

It can readily be seen that our efforts against this type of violator would be seriously affected without the use of the impounding procedure.

A comparison of 24-hour weekday traffic averages of permanent machine counting—stations, mostly located at the approaches to the city, indicates an increase in moving traffic of 49.9 per cent in the last ten years, 6.2 per cent within the last year. This factor also shows the necessity of moving the improperly parked car rather than merely issuing a ticket and permitting the car to remain parked so as to interfere with moving traffic.

Another factor that prevents better results with the impounding procedure is diplomatic immunity granted by law to certain representatives of foreign countries. If a vehicle bearing "DPL" is parked where it would be a violation for others to park, there is nothing the police can do about it from an impounding standpoint.

A similar condition exists insofar as members of Congress are concerned. Section 6 (c), Traffic Acts for the District of Columbia, is cited in part: "That hereafter, congressional tags shall be issued by the commissioners under consecutive numbers, one to each Senator and Representative in Congress for their official use, which when used by them individually while on official business, shall authorize them to park their automobiles in any available curb space in the District of Columbia, except within fire plug, fire house, loading station, and loading platform limitations, and such congressional tags shall not be assigned to or used by others."

## Improvements Indicated

The increased demand on the cranes for impounding service, particularly during rush periods, clearly points out the need for additional cranes and personnel to operate them.

Better located storage spots would help by reducing the time consumed per impounded car.

Studies have been made as to available District-owned property

P. D. 172

**METROPOLITAN POLICE DEPARTMENT**
**Washington, D. C.**

**REPORT OF AUTO IN POSSESSION OF POLICE**

Date ....., 19 ....

IMPOUNDED ☐ STOLEN AUTO ☐ ABANDONED ☐ TAKEN FROM PRISONER ☐

Name and address of prisoner .....

Charge ..... Date ..... Case No. .....

Prisoner at ..... Auto now at .....

Arrested by .....
NAME PRECINCT OR BUREAU

Reported in telephone message No. ..... Date ....., 19 ....

Tag No. .....
YEAR MODEL MOTOR NO. TYPE OF BODY

.....
OWNER ADDRESS

Condition of body .....

Condition of chassis .....

Number of tires ..... Condition of tires .....

Accessories, tools, etc. .....

Anti-freeze ..... Radiator Drained ..... Date ..... Time .....
YES OR NO YES OR NO

Car checked by .....
SIGNED BY OFFICER PRECINCT OR BUREAU

Property taken from vehicle .....

.....

Missing or damaged accessories .....

.....

.....

Violation(s) .....

.....

Amount of collateral to be taken $.....

.....
OFFICER REQUESTING TOWING

.....
PRECINCT OR BUREAU

.....
DATE AND TIME OWNER NOTIFIED BY WHOM

**FOLLOWING DATA FURNISHED BY PERSON IN CHARGE OF CRANE**

Date towed ....., 19 .... Time towed ..... A. M. / P. M.

Location from which vehicle was taken .....

.....
PERSON IN CHARGE OF CRANE

**FOLLOWING DATA FURNISHED BY STATION CLERK—COLLATERAL**

Date collateral deposited ....., 19 ....

..... .....
NAME OF PERSON DEPOSITING COLLATERAL ADDRESS

..... .....
PERMIT NUMBER STATION (COLLATERAL) CLERK

P-1370

.....
PRECINCT OR BUREAU

FIGURE 4. PD 172 Report itemizes any damage, missing accessories, or property removed by officer.

which might be used for this purpose. A suggestion that storage spots be made on side streets adjacent to arterial roadways is looked upon with disfavor because of the police responsibility for all property that comes into their custody. The impossibility of safeguarding vehicles moved to on-street storage spots can readily be seen.

One has only to analyze the effect of the impounded car vs. the ticketed car upon moving traffic to make a case in favor of the impounding procedure. A ticket placed on a car—a ticket that can be paid for at a later date—may have some effect from a deterrent viewpoint at some future time. The effect on moving traffic is felt immediately when the illegally parked car is removed from the roadway, which is the desired result.

It is not intended that anyone should construe from statements made here that the impounding procedure is a cure-all for a city's parking problem. It is at best only a temporary measure designed to assist immediately in correctng an existing problem. There will always be need for this function because of certain drivers' predisposition to violate parking regulations.

By and large, most drivers will obey parking restrictions if some means of parking their cars are made available within a reasonable distance. On February 26, 1952, the Commissioners ordered the Corporation Counsel for the District of Columbia to prepare legislation for a District-backed program for new off-street parking garages. The program would include a revolving fund borrowed from the Federal Government to finance private construction of garages in the downtown area. The Engineer Commissioner suggested that the amount of the fund should be $20 million and the District Motor Vehicle Parking Agency concurred in this recommendation. The seriousness of the District's parking problem can be better realized when we remember that this recommendation for borrowing $20 million represents Washington's first departure from the pay-as-you-go plan.

It is hoped that this action by the Commissioners will rapidly reach the construction stage, but until then we have impounding.

# Balancing the Highway Needs for Both Rural and Urban Areas

DEWITT C. GREER

*Mr. Greer is State Highway Engineer of Texas. After joining the Texas Highway Department in 1927 as Field Engineer, Mr. Greer's experience has included service as District Engineer and as Chief Engineer, Construction and Design. Since he became State Highway Engineer in 1940, the paved mileage of the Texas Highway System has increased from 18,000 miles to the present total of over 40,000 miles. He is a member of the American Society of Civil Engineers. He was elected president of the American Association of State Highway Officials in 1949 and was the administrative leader of that national organization during 1950. At present he is a member of the Executive Committee of AASHO.*

WHEN this nation was able to foresee the possibility of the close of World War II, highway leaders both in Congress and in the states began to form plans for rehabilitating the country's highway system. The outcome of these efforts was well expressed in the Federal-Aid Highway Act of 1944.

This Act demonstrated the courageous and wise highway leadership by forming a new approach to the problem of highway development. It is now accepted that this far-reaching legislation established the principle of a balanced system or pattern of highway development through the years following the war.

This Federal-Aid Highway Act visualized for the first time that the three main branches of highway development—the primary or trunk line arterial system, the urban system, and the secondary or feeder system—would be gradually brought to a system of perfection. This would be accomplished in a planned and systematic manner by earmarking funds for specific use on these three categories of highways to provide a balanced program of development. The policy has been maintained in the subsequent Federal-Aid Highway Acts since the close of the war and has meant much to the highway administra-

tors of this country by leading the way to establishing and maintaining this balanced type of development.

To picture how this planned program of synchronized construction and reconstruction of highways would evolve, one need only take the secondary or feeder roads as provided in the Act and note the traffic pattern as these roads are completed. The farmer, the rancher, or simply the rural resident who had in prior years found it most difficult to reach the nearest community with his motor vehicle, suddenly finds it possible to move over a paved secondary road in all kinds of weather, not only to his nearest trading point but also to the far reaches of the trunk line highway system of this country.

It would naturally follow then that this rural traffic begins to flow in all types of weather over the secondary roads into the primary or trunk line system. This same traffic is then welded into the trunk line traffic and moves over the arterial system eventually reaching the urban and metropolitan centers of the country. At this point, this same traffic enters the urban traffic forming a mass movement into the heart of these urban areas.

## Shift in Population

The ready availability of all-weather transportation facilities resulting from our co-ordinated program of road development during the last eight years, has, to a degree, contributed to the rather distinct shift of population from the rural areas to the urban areas, as indicated by the 1950 census. In many cases, this trend is explained by the fact that improved roads in the rural areas feeding through the trunk system into the urban areas, have enabled rural land operators to live in the urban center where he may have adequate schools and other facilities and go back and forth, to his rural land.

His commuting activities contribute to a reverse shift in the previously stated movement of traffic but accentuate the traffic safety and congestion problem, because of increased use of the same vehicle over an annual period. If we add to this factor, the simple and well-known characteristics of more people with more money buying more cars, traveling more miles, we readily understand why we find our-

selves in the present muddle of highway inadequacy as compared with traffic density.

In the early days of our highway departments, emphasis was placed, and rightly so, upon linking the more important centers of population with a network of main highways. City dwellers strongly advocated this policy inasmuch as city streets had always been relatively well improved, and the rutted rural road, beginning at the city limit, was the barrier to more extensive travel. After these rural sections of main highways were laid out, the next primary objective, and one in which all citizens were equally interested, was to pave all the remaining gaps on our primary highways.

Many states, Texas among them, have completed this second objective within the last two decades.

After completion of the primary system of trunk line arterial highways in the nation, an increased movement for all-weather secondary roads received great impetus and at present continues unabated. Since the early 1900's the trend has been to lodge more and more responsibility for the management and financing of roads and streets in the states and, to a lesser extent, in the federal government. This trend probably reached its height in the early 1930's when North Carolina, Virginia, West Virginia and Delaware assumed complete responsibility for all their local roads, but the movement continued sufficiently strong to occasion the delegation by the national Congress to the states of the responsibility for the construction and maintenance of the new system of Federal-Aid Secondary roads authorized under the Federal-Aid Highway Act of 1944.

Thus at the mandate of the people and the Congress, the various states set to work to construct a system of secondary roads. Meanwhile, an astounding development was occurring. The number of motor vehicles in operation soared from a little over 30,000,000 in 1940 to close to 50,000,000 in 1952. An avalanche of traffic has fallen largely on the main highway and city streets, and as a consequence, the systems that had been so laboriously created over the years have bulged to a dangerously strained point.

There can be little doubt that the most recently built system of secondary roads has outstripped the other two systems and is now

in the lead. The problem is not how to cut back the secondary program in line with the urban and trunk line highway program, but rather, how to bring the urban and trunk line programs up abreast of, and in balance with, the secondary program.

### Federal Aid Constant, Expenditures Change

As originally formulated by the highway leaders, in the national Congress and in the states, the balanced program of highways embodied in the Federal-Aid Act of 1944 called for allotments of 45 per cent to the primary system, 30 per cent to the secondary system, and 25 per cent to the urban system. While that Federal allocation has remained constant, the expenditures on the three systems has not. By supplementing with state appropriations and other funds, including bond issues, some of the states have launched vast secondary road construction programs, far overreaching their planned developments on the main and urban highways. Other states have put every loose nickel into the primary or trunk line system only to discover that they are still unable to cope with the needs of modern traffic.

Texas has never financed state highways, urban extensions of those highways, or rural roads by issuing bonds. She was long ago committed to the pay-as-you-go principle. Our counties and cities, with no such limitation, have used the bond issue when voters felt the needs so justified. In 1941, our counties issued $11 million in road bonds and paid off $9 million. In 1949 these counties issued $26 million in bonds and paid off $13 million, a respectable increase in both categories. In the cities, however, a catastrophe of traffic strangulation was in the making. While $2 million in bonds were issued in 1941, $19 million were issued in 1949, with repayments of $3 million and $5 million, respectively. In other words, the cities were assuming new bonded indebtedness at a rate representing a 850 per cent increase in eight years!

Similarly, during the above mentioned eight years, Texas cities increased their public street and road construction 804 per cent, the counties 240 per cent and the state 185 per cent. While these increases possibly reflect, to some extent, the relative *needs* of three road-building agencies in the state, they do not, in view of the bor-

rowed credit feature, actually reflect the *ability* of these governmental bodies either to build or to finance such an increase.

Federal, state and city officials are deeply concerned about this mutual problem, and far-reaching urban programs are underway. These joint undertakings, based upon cooperative effort and expense, are already setting a pattern which may be a step in the ultimate salvation of the major cities in the country.

The highway administrator of today finds himself in a most complicated dilemma. The over-all finance available to him for the development of this balanced pattern of roads and highways is completely inadequate to cope with either the public demand or the facts and figures that show unquestionably the minimum or tolerable needs in the light of present day traffic requirements.

He finds that the public demand is far greater in the rural portion of this balanced program than in the other sections, due probably to the fact that these roads have never had satisfactory improvement of any type over the period; whereas, the trunk system and the urban street patterns have, over a period of years, received some type of improvement to the end that traffic is able to get over them in all types of weather. The administrator also finds that the work in the rural area is quicker to develop and easier to perform. Its complications are much less than either the main trunk system or the urban developments.

The urban developments are particularly difficult due to the tremendous right-of-way problems, the complications of railway and street crossings, and other factors that are well known. From the point of inception to the date of completion, the urban type of project is the slowest of accomplishment and the secondary or rural road is probably the type of project that can be developed and completed in the shortest period of time.

### Effect of Shortages

Critical material restrictions in recent years have also had some effect on the balance of the three types of improvements. The urban system, with its usually large number of structures, and the primary or trunk line system, with a smaller, but still large, requirement of

structural steel and other scarce materials, have drawn short straws. The secondary system, on the other hand, has struck a windfall in that few critically scarce items are needed on typical secondary construction. Therefore, some states, anxious to proceed full tilt with work that needs to be done, have necessarily moved rapidly on secondary projects, while primary or urban projects were held up by lack of materials.

These factors are mentioned to illustrate the point that regardless of how sincere a highway administrator may be in his desire to maintain a balanced program, there is a distinct and constant influence away from equilibrium.

The highway administrator of today fully realizes that the highway safety problem is present on all three categories of roads. The accident rate on the secondary or rural type of road is gradually rising as these roads are developed to a paved status and traffic density and speed are increasing. It has been the consistent policy to develop these land service roads to minimum standards in order to hold the cost down and secure more miles for the same available funds.

It is necessary that many of these low-cost roads wind through the rural areas in order to serve more adequately the rural population. Highway officials use caution signs and speed zoning powers in an attempt to use these low cost roads for adequate movement of traffic with safety. Unfortunately, these devices do not seem to provide the answer to traffic safety on these rural roads, due to driver indifference and flagrant violation of speed zoning laws.

The trunk highway system is unquestionably the keystone to the arch in the entire pattern of highway development. It is readily comparable to the blood arteries of the human body through which all blood must flow from the heart to the feeders in the fingers, the toes, and other remote parts of the body. It is the system that is generally taken for granted by the public as having been completed with no further notice being necessary. This is, of course, far from true. Its obsolescence and its increase in traffic density and speeds readily bring it into the position of being the traffic death trap of this nation. Highway administrators and engineers must be bold in their approach to the development of this system, even though faced with the almost impossible odds of completely inadequate finance. All

of the modern techniques available to the designing engineer must be used in new construction on the trunk highway system wherever possible, in order that the engineering side of traffic safety may be advanced in every way possible. On this trunk system the designing engineer meets all of the problems known to modern day traffic including an unanticipated increase in traffic volume and an unpredictable control of highway speeds.

The urban development of highway entrances into and out of our metropolitan centers, as well as our smaller urban areas, must be expedited in every way possible, not only because of the real merit of these badly needed improvements but the slowness that appears to be inevitable in the development of projects of this type. Petty jealousies between the city government and the state government, as well as the Federal government, must be forgotten, and a partnership must be formed with an attitude of give and take in order that the movement of these projects may not be seriously impeded. Modest old-time street widening work in the heavy metropolitan areas will not accomplish the objective. Controlled access expressways constitute the challenge of today to both city and state officials in order to provide for the mass movement of traffic with speed, comfort, and safety. Over-all general direction to follow flow patterns of traffic is necessary in handling routes and locations. Adequate width is fundamental and must be secured.

With these geometric principles agreed upon and a bold approach made the actual type of construction performed could be evolved commensurate with available finance by stage-construction development. Many problems can be temporarily satisfied by the utilization of the service lanes on the outer edge of the right-of-way as the first step in stage-construction. This gives a right-of-way reservation pattern with the reservation in the center of the right-of-way rather than along the edges. Traffic and public demand will bring about the construction of the through or express lanes in a reasonable period of time.

## Summation

The extreme importance of courageous and sincere administrative decisions, based on both economic and traffic factors and require-

ments, cannot be overemphasized. The highway administrator must continue to sell the principle of the balanced program of development between the three categories of highways to the citizenship in his area. He must then be constantly alert in order that this balance may be successfully maintained and the continued traffic increase brought about by the development and prosperity of America may be adequately served.

# Traffic Engineering in Switzerland

DR. KURT LEIBBRAND

*Dr. Leibbrand holds a doctor of engineering degree from the Technische Hochschule Berlin. He served as a railway official with a short interlude at the German Autobahnen. After the war he became a consulting engineer and has assisted thirteen city administrations and several government agencies in Germany and Switzerland in plans for rebuilding their railway or street systems. Since 1948 he has been a part-time university teacher at the Technische Hochschule Stuttgart, Germany. In 1950, Dr. Leibbrand was chosen to hold the first professorship of railway and traffic engineering at the Eidgenossische Technische Hochschule Zurich (Federal Technical University). He has published articles on planning and layout of urban street systems and railway terminals and is a member of the Swiss Society of Engineers and Architects, Union of Swiss Highway Engineers, and the German Society of Civil Engineers.*

TRAFFIC engineering in Switzerland is different from traffic engineering in the United States. Traffic on European roads is not uniformly motorized like traffic in America. In Europe the needs of a great number of different types of vehicle have to be considered.

For example, problems of heavy bicycle and motorcycle traffic are not frequently encountered by the American traffic engineer. However, in a Swiss city, we found as late as May, 1951 that the traffic at a typical important intersection was constituted as follows: only ten out of every 100 persons passed in passenger cars while thirty used motorcycles and bicycles, and more than fifty used street cars. The remainder rode on trolleybuses, buses and trucks.

There is another important difference. The business districts in nearly all Swiss towns still have a narrow, cornered (and beautiful!) ground-plan unchanged since medieval times. It is extremely difficult to develop the necessary efficiency for desirable street traffic operations. A close collaboration of traffic authorities with city planners and architects is essential.

Within the last few years, traffic troubles have become the major

problem in many Swiss towns, and especially in the largest cities. During rush hours, streets and intersections are overcrowded. The curve of accidents is going up without interruption and has reached an alarming height. In 1950, nearly 800 persons—or every 6,000th citizen of Switzerland—were killed by traffic accidents. Business life and vitality in cities are being hampered by traffic congestion. Much is being done to ease the situation, but traffic is steadily increasing and with it the fear of serious losses in the economic life of the cities.

To many these traffic troubles are surprising. Switzerland is a rather small country with only 4.7 million inhabitants. The largest city, Zurich, has 390,000 inhabitants. Other cities with more than 100,000 population are the capital Bern, Basel, Geneva and Lausanne. The ratio of population to motor vehicles for the entire country is about one vehicle per sixteen persons (including many motorcycles), in several cities up to one per seven, against an average ratio of one per three persons in the United States.

However, the picture changes if the number of vehicles is related to the size of the country or to the mileage of roads. Switzerland averages a high density of population despite the fact that in the Alps the density is very low. Therefore, on every square mile of the country there are

| | |
|---|---|
| In Switzerland | 2.8 motor vehicles and 17.2 bicycles |
| In the United States | 2.2 motor vehicles |

On every mile of the roads there are

| | |
|---|---|
| In Switzerland | 6.3 motor vehicles and 38 bicycles |
| In the United States | 5.7 motor vehicles |

### Rapid Increase in Swiss Traffic

Of course, traffic at the focal points in the gigantic cities of the United States is incomparably greater than anywhere in Switzerland. The Swiss figures include many more motorcycles as mentioned above. However, the average number of motor vehicles in the country and the density of vehicles on the road system in Switzerland today already equal the corresponding American figures and they will by far outnumber them in the near future. For this reason a big

program to rebuild the nation's highway system is just being started, covering 2,300 miles of highways—nearly 1,000 miles thereof in the Alps—at a cost of about 120 million Swiss francs.

The following table shows the growing number of vehicles in Switzerland:

| *Year* | *Motor Vehicles** | *Bicycles* |
|---|---|---|
| 1938 | 124,000 | 1,210,000 |
| 1948 | 189,000 | 1,550,000 |
| 1949 | 219,000 | 1,750,000 |
| 1950 | 264,000 | 1,800,000 |
| 1951 | 300,000 | |

* Includes motorcycles.

During the last two years the number of passenger cars alone went up 40 per cent. Since 1947 it has doubled. The country has a good system of public transit in excellent condition (railways, cable cars, tramways, trolleybuses, buses). Also, distances are short so it is not to be expected that the American ratio of population per car will be reached. Often a future ratio of one motor vehicle per eight to ten inhabitants is taken as basic, as elsewhere in Western Europe. In the years to come we will see whether this is a fair estimate or not. It means that the number of passenger cars in Switzerland will be doubled once more. The street system must be adapted to the swiftly growing traffic volume.

In the country it is relatively simple to enlarge and improve roadways. Often narrow passages through villages can be avoided by new streets passing outside. New highways outside the cities may be constructed through undeveloped areas. The performance of existing highways may be increased by physical improvements, by good markings and signs, by removing railroad grade crossings, by grade separation, and by other measures.

In cities the situation is different. Corresponding with the great number of inhabitants and the economic importance, the densest traffic gathers here. Within one year's time the number of vehicles increased by 20 per cent, but it is wholly impossible to improve streets, squares, intersections and parking lots all over the city within the same time by 20 per cent, too.

The situation is nearing a climax. Everywhere traffic problems

are being discussed. Traffic has become a number one problem in the few years since the end of the war. We look to the American way of dealing with traffic problems and we have to adapt traffic engineering to circumstances prevailing in this country. Traffic trouble can be helped in two ways: by administrative and by technical measures. These are the foremost tasks of the traffic engineer.

### Three Causes of Traffic Problem

To stop the growing difficulties we have to find out why they occur. The present troubles were brought about principally by three different developments:

1. *The growing population in towns and in the country.* Particular attention is to be given to the swift growth of population in cities.

2. *The steadily increasing requirements of traffic.* The "specific requirement of passenger transport," i.e. the number of miles traveled in one year per capita, and the "specific requirement of goods transport," i.e. the ton-miles per capita in one year, are rising slowly but steadily. When viewed over a long period, the increases are substantial. For instance, specific passenger transport is increasing one per cent a year in this country.

3. *The change in passenger traffic from mass transportation to individual transportation.* In the first instance the traffic troubles are *not* caused simply by increasing traffic demands but by the developments mentioned here. Streets would still be adequate for all traffic if only trucks and lorries, buses, trolleybuses and street-cars were in use. However, today people want to be independent and they prefer individual means of transport—passenger car, motorcycle, and bicycle. These vehicles need much more street and terminal space. A business man who up to now went to town by bus and who is going to use his own car for these trips in the future claims six to eight times the space on streets he needed before. If a man changes from street-car to bicycle he will want up to four times the space he occupied before the change was made.

Administration, planning and technique have to be employed to distribute the available surface of the streets as economically as

possible, and to build up an efficient urban transport system at moderate cost. The urban traffic engineer may apply the following means:

1. *Operations and traffic regulations.* These include closing entrances and exits on arterial roads, installing one-way streets, stop signs, and traffic signals.

The Swiss people do not like regulations. Therefore they are applied to a small extent only. In Switzerland people still park their cars on a highway and they do so even on the left side of the street. When driving on arterial roads in cities you have *not* the privilege of passing when another car enters from a narrow lane on the right side, for there are only a few stop signs up to now. People have to be shown that traffic regulations are not an offense to the deep-rooted feeling of freedom.

On certain narrow highways in the Alps there is an interesting exception from the general rule of driving on the right side. Post buses always drive on the side of the mountain, leaving the dangerous side—the valley side—to the meeting vehicle; sometimes they drive right and sometimes left. The roads where the buses have this privilege are clearly marked.

2. *Control of working hours.* If works, shops and business firms start and stop working at different times, peak traffic will be lowered. Vehicles and roads will be used more efficiently. All over Switzerland we have a divided working time, Mondays through Fridays 8–12 noon and 2–6 p.m. Recently long discussions have taken place in Zurich to promote uninterrupted working hours in order to eliminate the greatest traffic peaks at noon.

The resistance to such a measure is great for several reasons. People fear that family life will suffer if father, mother, son and daughter no longer eat their lunch together at home. Employers are not prepared to serve a meal, and a meal in a restaurant is much more expensive than at home. Also, it is feared business performance will suffer if working hours are fixed at different times at various places in the country. The public transit authority intercedes for the new rule, but it is doubtful whether it will succeed.

To make a start the offices of the city government are opened and closed twenty minutes earlier.

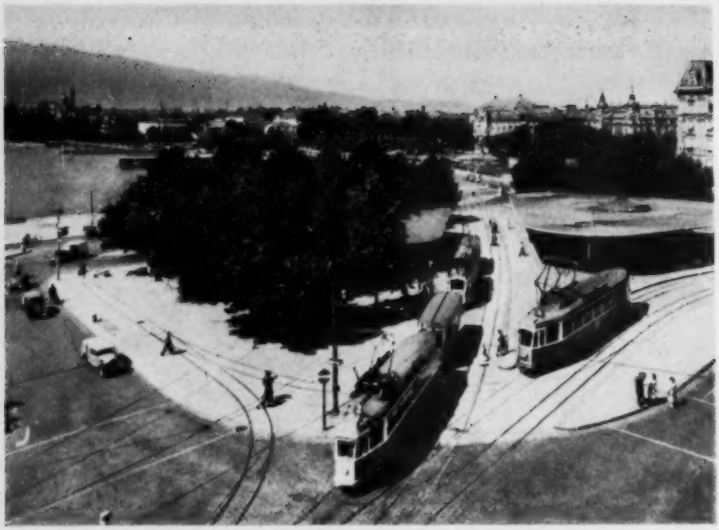
3. *Relocation of businesses and shops.* In collaboration with national and regional planning, traffic requirements can be simplified. It is most desirable if the daily travel between home and working place can be made by foot.

The regional planners are trying to get the growth of the cities under control. In doing so they won public consent. People fear democracy would be jeopardized if there were more voters in a city than in all other communities of the "canton" together, and one community could outvote all others. This supported trend meets the desires of the traffic engineer.

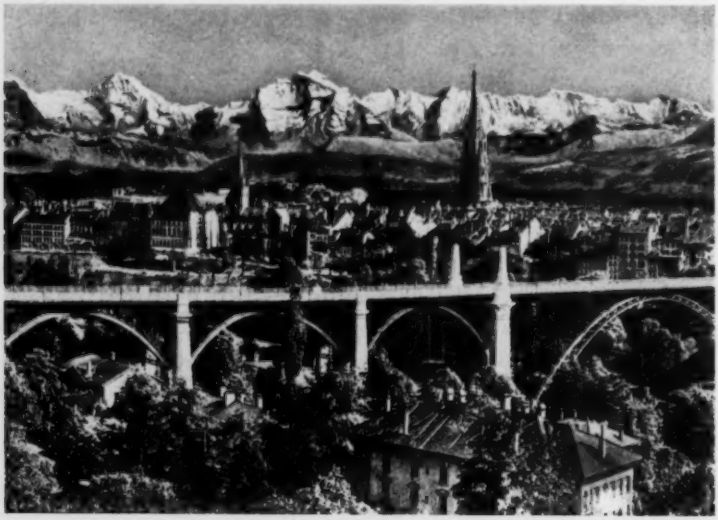
4. *Limitation of the number and height of skyscrapers.* Skyscrapers concentrate traffic. They thereby increase traffic troubles. Up to date there are only a few unusually high buildings in Switzerland. Recently architects started to prepare plans for buildings up to ten stories. It is uncertain whether warnings of traffic engineers alone will be adequate to prevent construction of tall buildings, but they are assisted by the common feeling that the "skyline" of the old Swiss cities must not be altered or even overshadowed by modern buildings. There are sharp restrictions on building heights in all cities.

5. *Construction of roads for through-traffic.* In cities, these roads cannot be placed far away from built-up areas as in small villages in the country, for most of the traffic flow has its destination in the city itself. The nearer these urban arteries for through-traffic can be placed to the central district the better. It is difficult to choose, trace, and complete such roads in beautiful Swiss cities with old ground-plans developed through the centuries and with their intricate topographical conditions.

6. *Planning of parking facilities at the city's periphery.* Parking structures and lots strategically situated at the border of the overcrowded inner district of the city will encourage many drivers to stop there. Connections between parking garages and the heart of the business district should be provided by public transit. This view is opposed by many drivers. However, architects and city planners propose that important shopping streets should be open for pedestrians only, and that quiet zones without any traffic on wheels should be organized in the beautiful centers of the cities. In some places pedestrian districts already exist.



An important intersection in Zurich, this round-about is crossed by tracks and main street-car stop.



Bern, high over the river Aare, is connected with its suburbs by bridges 120 feet above the water.

Everywhere parking on the streets is still free. It is expected, however, that the first American-made parking meters will be tried soon in Swiss cities, and it is hoped that private drivers will then avoid parking in the metered districts.

7. *Development of public transit.* If public transit uses outmoded, slow and uncomfortable vehicles, people will prefer to use their own cars. If fares of tramways and buses are raised, the number of bicycles will go up. This means greater street congestion. Public transit in Switzerland is good. The well-known Swiss works for the construction of rolling stock produce street-cars and buses of a high standard. Unfortunately in Swiss cities—as nearly everywhere else in Europe—public transit has to pay all its expenses (capital and operating) from its revenues, while new parking lots and roads are partly constructed and paid for from common taxes and may be used free of charge. By this method, public transit, while making the most economic use of street area, suffers a handicap.

Traffic engineers hope that in the future bus terminals and street-car stations will be paid for by taxpayers to the same extent as are parking lots for private cars, and that public transit will be subsidized when changing from surface to underground service.

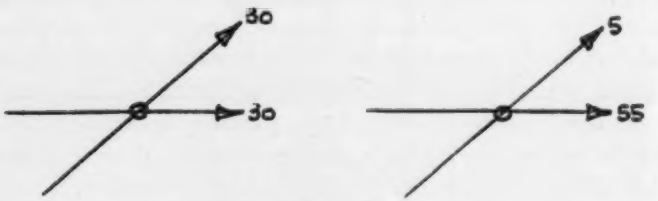
Public transit of smaller towns will no longer use street cars. But in cities of, say, over 100,000 inhabitants only feeder lines will be operated by trolleybuses and Diesel buses. Mass transportation is handled more economically by rail in Switzerland. Electric traction is preferred because electricity is always available in this country.

8. *Preparation of general traffic plans.* Every change in a street, such as the construction of a grade separation or the prohibition of a left turn movement, influences all neighboring streets and intersections. It leads to changes in the magnitude and direction of traffic flow in the whole area. Therefore it is necessary to prepare a comprehensive plan for increasing the efficiency of the urban traffic system before studying any single location, such as an overcrowded intersection. The places for new bus or truck terminals are to be chosen with special care for they cause heavy traffic concentrations. In the near future, such accommodations will be needed in all large cities in Switzerland. Always the *whole* traffic system and the cooperation of all means of transportation, including pedestrians, are to be considered and observed.

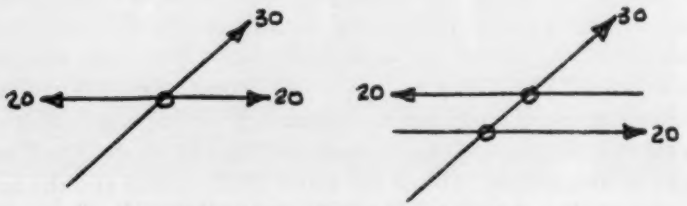
9. *Separation of public and private traffic.* The efficiency of the street system must be increased for both kinds of traffic. In Zurich, Bern, Basel and Geneva, most of the public travel is handled by street cars. Dense traffic of tramcars and dense motorized traffic hinder each other, especially at intersections and at street-car stops. A separation of the two traffic systems in the central district becomes desirable. This may be effected where parallel streets are available. Inevitable crossings between important street-car routes and highways should be developed at as nearly right angles as possible. The turning of street-car tracks into or out of highways should be avoided for it lowers the efficiency of those valuable routes. If the traffic at the crossing is too dense, a grade separation should be provided.

## Mathematical Solution for Traffic Plans

When checking intricate intersections, the street system of an urban district, or a general traffic plan for the whole of a city, I try to apply a new mathematical method. For the solution of such problems a range is needed which allows a clear judgment over a great number of possibilities. The method was first worked out to deal with railway problems.




Crossing of 2 tracks




Crossing a single track and a double track line

The operating efficiency of a railroad terminal depends on the performance of tracks and crossings. The capacity of the tracks may be found in an easy manner; however, it is difficult to check the interferences of numerous grade crossings. One may start by considering the time the different movements require. For instance, a crossing is occupied by a train five minutes; the two crossing tracks are used by 30 trains per day each; the crossing is occupied $(30 + 30) \times 5 =$ 300 minutes daily. Now, if one track is used by five trains only, and the other one by 55 trains, the same time of occupation is found, i.e. $(5 + 55) \times 5 = 300$ minutes. The occupation of the two crossings seems to be exactly the same but as a matter of fact the effects of the occupation on the operating of the station are quite different.

In the first example, in an unfavorable situation, everyone of the first 30 trains will meet exactly one of the second 30 trains. They will have to wait till the crossing becomes free, and they are all delayed. In the second example, the five trains on the one track will be able to stop no more than five of the 55 trains on the other track. The remaining 50 trains will circulate without any trouble. The *addition* of the times of occupation or of the number of trains will not give a true picture for comparison.

If a single track line with 20 pairs of trains per day is being crossed by a track with 30 trains daily, then the crossing is occupied 70 times a day. If the same line enters the station with two tracks, each of the two crossings is occupied 50 times, and both crossings together 100 times. However, the performance of the station has certainly not been reduced. On the contrary, if there is enough space to stop the 30 trains between the two crossings and to let them wait, the performance is even increased. The addition gives a result which is opposed to reality. Moreover it is found that the *number* of crossings may not be used to indicate the operating performance of a track system for in this case the better solution shows *more* crossings.

A better measurement is obtained if we proceed from the fact that in the first example, in one case 30 trains depend on the timetable of 30 other trains; in the other case 5 trains depend on 55 others. These "dependencies" may be expressed by multiplying the numbers of trains. The proportion of the dependencies is now $(30 \times 30) : (5 \times 55) = 3.3 : 1$, against 300 minutes: 300 minutes =

1:1, when the addition is made. In the second example the dependency of the crossing of the single track line is 2 x 20 x 30 = 1200, while with the double track line each crossing is 20 x 30 = 600 resulting in the same sum of 1200.

If at all crossings of a track system the dependencies are found by multiplying the numbers of trains, and the products are added, one will not obtain an absolutely correct measurement but one which is highly useful and may be found in a relatively short time. However, speed is decisive for an enormous number of combinations have to be checked.

When examining a street system one may proceed in exactly the same manner. First there are the tracks of the street cars. For all other kinds of vehicles, instead of track crossings there are lane crossings. Once more, from a great number of solutions the best one is to be chosen without too detailed calculations.

Again the performance of the crossings is decisive. The *number* of danger points, the number of crossings and of junctions of lanes in the different arrangements is interesting to know. However, the enumeration of danger points is not sufficient to judge the various solutions. It is not taken into consideration whether the crossed lane is a narrow or a broad one—especially in one-way traffic—and how dense the crossing traffic flows are. Therefore the crossings are to be given a certain value, a dependency.

After traffic investigations had been made for several cities, it was found that—like the railway track systems—a suitable range of dependencies is obtained by multiplying the number of crossing vehicles or pedestrians. I repeat: the scale is not an absolutely true one, and it has the dimension of "square vehicles" making no sense. But the scale is useful, and it is speeding the investigations in a surprising manner. It is not necessary to count any vehicle equal with another one or even a vehicle equal with a pedestrian—any graduation is possible. Thorough comparisons showed that the graduations may be made rather roughly and with plain figures in order not to render the calculations more difficult. Careful graduations have only a small influence on the result.

In the examination of an intersection, the travelers were given the following values:

| | |
|---|---|
| Motor vehicles | 1 |
| Bicycles | 0.5 |
| Pedestrians | 0.1 |
| Buses (autobuses and trolleybuses) | 2 |
| Street cars (trains up to 100 ft. long) | 4 |

In some cases motorcycles and trucks may be given a special value too. Here they are included in the motor vehicles getting the same value as passenger cars.

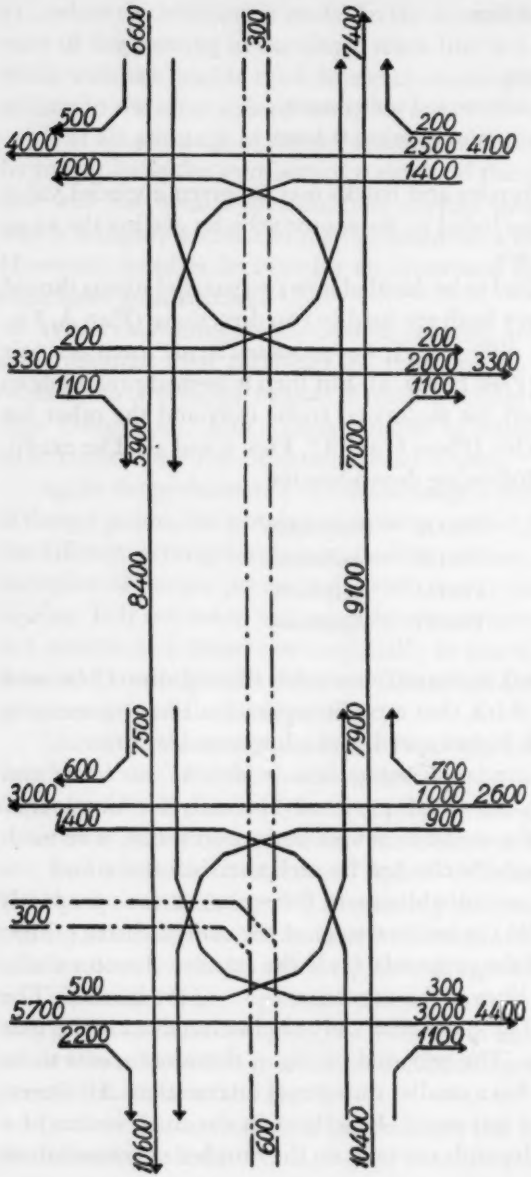
In a Swiss city it had to be decided how two parallel streets should be used. Actually they both are used in two directions (Plan A, Fig. 1). For easing traffic difficulties it was proposed to use them as a pair of one-way streets. (Plan B, Fig. 2). But then it seemed preferable to use one of the streets for motorized traffic only and the other for street cars and bicycles (Plans C and C′, Figs. 3 and 4). The examination showed the following dependencies:

| | |
|---|---|
| Plan A | 263,700,000 |
| Plan B | 244,800,000 |
| Plan C | 177,700,000 |
| Plan C′ | 165,900,000 |

As a result of the check it was recommended that solution C′ be used for the future. We think that a traffic separation like this means a higher capacity with higher speed, and a lower accident rate.

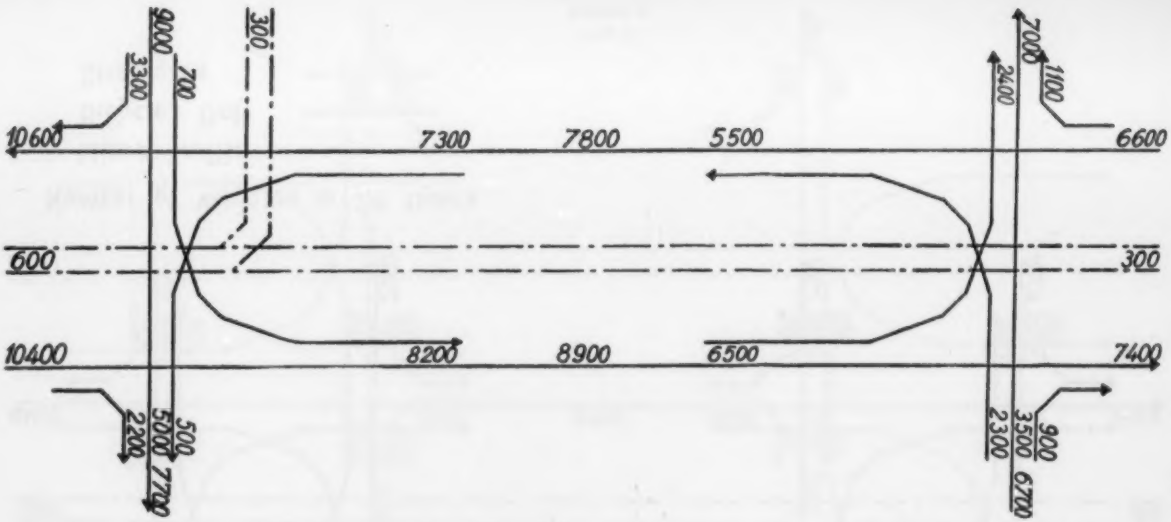
In such a case special investigations in drivers' attitudes and automobile performance are of restricted value only, for bicycle traffic always disturbs the constant flow of motorized traffic. The medley of vehicles can only be checked by such a statistical method.

In a city of 500,000 inhabitants in Germany, various proposals were made to rebuild the traffic system of the central district. Figs. 5 and 6 show two of the proposals. Only the arteries of motor traffic (————) and the lines of the street cars (– – –) are marked. The proposal shown in Fig. 5 contains only six intersections while that in Fig. 6 has twelve. The proposal in Fig. 5 therefore seems to be the better one for it has a smaller number of intersections. However, the intersections are not equal. Exactly as in the track system of a railway station, all depends not only on the number of intersections



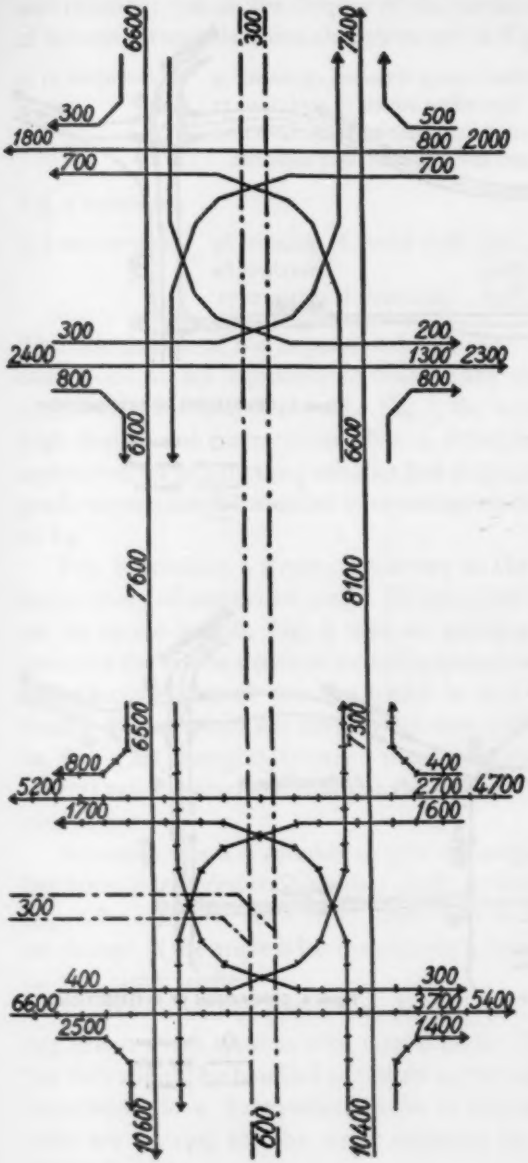

Plan A
FIGURE 1

Plan A
FIGURE 1




Plan B
FIGURE 2

Plan C
FIGURE 3




Plan C'
FIGURE 4

FIGURE 3

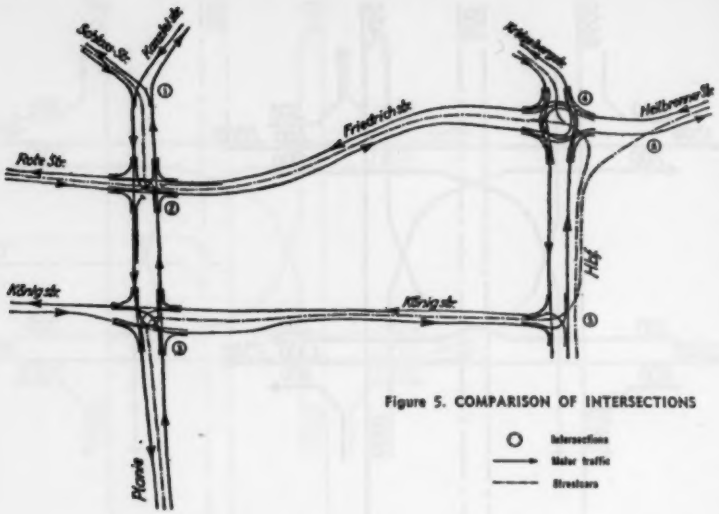



Figure 5. COMPARISON OF INTERSECTIONS

Figure 6. COMPARISON OF INTERSECTIONS

and crossings but on the density of the various traffic flows. A view of the two proposals shows that there are in Fig. 6:

| | |
|---|---|
| at 12 intersections | 34 crossings between motor traffic in two directions<br>23 junctions of motor traffic and<br>20 crossings between motor traffic and street cars or between two lines of street cars. |

Fig. 5 contains:

| | | |
|---|---|---|
| at 6 intersections | 58 crossings of motor traffic | (70% more) |
| | 28 junctions | (20% more) |
| | 27 crossings of street cars | (35% more) |

The calculation of the dependencies verified this impression. The calculation makes it possible to observe any change in the traffic of pedestrians and bicycles too. In Fig. 5 the number of vehicles is so high that at one intersection (No. 2, Friedrichstr.-Planie) a grade separation for left turning vehicles had to be provided. Without this grade separation the number of crossings would be raised by 6 more to 64.

Fig. 6 provides a street-car subway in the same place, and the main artery of motorized traffic (Friedrichstr.) is free of street cars on its entire length. Fig. 6 uses an existing great square in the center of the city as a central stopping and changing place for nearly all street-car lines of the city which is very favorable for public transit. For automobiles there is one-way traffic around the square. In Fig. 5 all changing between street cars has to take place at the central railway station (Hbf.) at the periphery of the central business district.

In some cases it is suitable to take the angle $\alpha$ between the crossing lanes into account. This may easily be done by multiplying the dependencies by $1/\sin\alpha$. If the lanes cross with a right angle there is no change. If the angle is for instance 60°, the dependency is $1/0.866 = 1.15$ times higher.

Perhaps it will be possible to develop better methods for checking urban street systems with mixed traffic. However, for practical use they should be handled as simply as the method of dependencies described above. Everywhere traffic is increasing, and interesting tasks are waiting for the traffic engineer in all countries, and in Switzerland too.

# Emergency Highway Needs in Virginia

C. E. FRITTS AND J. O. GRANUM

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MANY states have reviewed the needs of highway systems to provide efficient and safe travel and have set up long-range plans to accomplish this goal over a period of time. Recently completed in Virginia was a pilot study aimed at determining the *least* requirements for providing a minimum tolerable service during an emergency period—a period during which both funds and materials would have to be conserved to the utmost.

Principles of this pilot study were reviewed in the Traffic Quarterly last year. This article reiterates some of those principles,

shows how they have been applied and the results that have been obtained, together with conclusions that can be drawn from those results.

During any emergency all highway agencies are forced to change their pattern to fit the cloth. Few have analyzed the consequent impact on highway transportation and safety, or the effect of such actions on their future budget, in the light of preserving and ultimately improving the plant to standards adequate for normal growing motor vehicle use.

At the request of General James A. Anderson, Virginia State Highway Commissioner (and then President of the American Association of State Highway Officials), and the State Highway Commission, the pilot study was carried out by the Automotive Safety Foundation with the cooperation and assistance of Virginia engineers and the Bureau of Public Roads. The work covered 2,700 miles of Virginia's principal roads and streets and was completed in December, 1951.

The basic concepts underlying the analysis are these:

1. The modern design standards adopted by the State Highway Department of Virginia (based on American Association of State Highway Officials' policies) are those most economically justified to provide facilities supplying essential transportation service at the least possible cost. These costs include those of vehicle operation, accidents, and the penalties of traffic delays, as well as the building and maintaining of highways. All elements of cost must be brought into balance to achieve maximum economy in total transportation charges.

For several decades these questions have been studied by engineers throughout the country. The standards represent the codified research and experience of agencies such as the Highway Research Board of the National Academy of Sciences, the U. S. Bureau of Public Roads, the state highway departments, colleges, universities and private agencies.

2. A defense economy—the basic reason for the present emergency—requires that highway service be sustained at reasonably efficient levels. Roads are not expendable.

3. The cost can be held to a minimum only through a planned program for the entire defense period (estimated for this purpose to be ten years). Annual scheduling of needed improvements must include replacement of surfaces and bridges as they wear out or become obsolete, and the entire system must be maintained at a reasonable level.

4. In view of the emergency, maximum use of existing facilities must be

obtained even at the sacrifice of some economies and efficiency in total transportation costs.

5. Where intolerable conditions do exist, emergency stop-gap measures should be used to the fullest practical extent and priorities should be set with consideration of their impact on materials and finances as well as transportation service.

6. Neither maximum use of present facilities nor application of stop-gap measures should be so extensive as to run the highway department into a financial dead-end or induce a breakdown of efficient safe motor vehicle use during or at the end of the emergency period.

## Specific Answers Needed

One way to get some of the answers is to assume a given amount of funds and materials which, during a given period, could be applied to the routes under consideration. Then the question would be, "What is the most efficient utilization of the money and the materials?" If such allocations were known, possibly the scope of the study could be limited. For example, if no structural steel were made available, any work requiring steel would automatically be eliminated from consideration. If construction funds were limited it might readily be seen that preservation of existing surfaces was all that could be accomplished. Such an approach would not satisfy the concepts nor would it give objective answers to the questions of how much steel and money should be allocated if disastrous consequences were to be avoided.

The preferred approach adopted for the Virginia study sought answers to vital questions in order to provide a guide to the minimum requirements and to establish principles upon which emergency highway operations should be based. In view of time limitations, the study was confined to a selected system of the principal rural state highways and urban connections. On this basis the study was able to establish the techniques, recommend principles of operations during an emergency, and provide objective results for that mileage.

It is believed that the techniques and principles are applicable generally, with some modifications, to the balance of the road and street systems and that the results of the study are indicative of the

general problem for the entire highway plant. The study did not attempt, however, to indicate the relative proportion of total available funds and materials that should be allocated to this important system. It is not known specifically what the requirements are on the balance of the 48,000-mile primary and secondary road systems under the jurisdiction of the state (all rural roads except for three counties) nor on other city streets.

Whether it is practicable or legally possible to meet even the minimum needs of the 2,700-mile study system in relation to the rest of the total network in Virginia is a decision that will rest with the Virginia administration. However, knowledge of the facts regarding the most important routes contained in this study at least provide a bench mark by which to judge the balance. Studies are continuing in Virginia that ultimately may enable the administrators to allocate available funds on the most equitable basis to do the greatest good for the greatest number.

Operating on the number one concept that highways designed to modern standards were the most economically justifiable ones, the engineering analysis first determined what should be a normal program for highway development over a ten-year period. Then, to meet the emergency situations, such a program was scaled down as far as possible within the limitations of the remaining concepts. Thus a double-barrelled approach was needed:

1. Establishment of a normal program to serve as a basis for comparison and for general planning.

2. Development of a minimum emergency program providing reasonable service and avoiding the pitfalls of being penny wise and pound foolish.

Widely adopted techniques, tested in a number of other states, were utilized to define what should be the normal highway program.

### Determining a Normal Program

Briefly, the first step was to set a degree of tolerance from standard which could be permitted on present roads and streets without creating intolerable congestion, accidents, operation costs or maintenance. These lower limits for the varying conditions of traffic and

terrain were set for every element of highway standards after engineering committees considered the effect of each of these elements on highway transportation efficiency and cost. In this process, full recognition must be given to the tremendous investment already existing in the highway plant, past design practices, characteristics of highway traffic and cost of making various improvements.

The second step was to apply these lower standards as a yardstick to measure the "tolerability" of each section of the existing road and street system. Sections falling below the tolerances in important respects, or in accumulation of minor ways, were deemed deficient.

Some 841 miles, or about one-third of the 2,475 miles of rural highways, failed to measure up to such limits. Traffic capacity was below tolerable limits on 333 miles, with safety a major factor on 90 per cent of all defective mileage. About one-fifth of the 670 bridges likewise were intolerable mostly because they were too narrow or poorly located. All except twelve met tolerable strength requirements. In cities, 66 per cent of the 223 miles of principal state routes was below tolerable limits. Nearly all such mileage had inadequate capacity and much of it had other deficiencies as well.

The third step was to determine the cost of correcting these deficiencies by providing facilities designed to full modern standards for anticipated traffic through a period ten years ahead. This resulted in estimates defined as the "backlog of existing need." The costs totaled $121,552,000 for rural improvements and $94,000,000 for urban improvements. The latter included almost 25 per cent for rights-of-way and another 35 per cent for bridges and grade separations.

These figures show the basic part of the normal program that should be carried out if highway transportation is to be served most efficiently and economically. It should be noted that this normal program fully recognizes it is impractical to produce a completely modern highway system. Some defects must be lived with, some inconveniences must be endured, some accidents must be suffered, and some greater maintenance costs will result in the interest of squeezing the last dollar possible out of the investment in the highway plant.

### Estimating a Complete Program

To determine a complete program, the remaining mileage of roads and streets found tolerable was analyzed in terms of its physical deterioration and ability to carry the increasing traffic volumes, to find which sections would become intolerable in each year of the ten-year period. The cost of correcting these deficiencies on a normal basis, added to the normal backlog of existing needs, produced a complete picture of what improvements should be made to provide tolerable or better service to motor vehicle transportation.

An additional 746 miles and 122 bridges will become intolerable during the ten-year period. The cost of normal improvement would be $95,587,000. Future urban requirements would be minor, totaling only $1,135,000, since completion of the urban backlog would handle most of the critical needs for the next ten years.

In addition of course, the maintenance requirements were estimated by determining short-comings in various maintenance operations and estimating the cost to overcome them as well as to continue good maintenance practices in the state. The cost totaled $3,266,000 per year on the rural system alone. Data were not available to estimate the maintenance requirements for the urban system.

All costs were computed at early 1951 values. The resulting annual requirements would be modified from year to year in accordance with the change in price levels.

For a ten-year period, then, almost $24,000,000 per year should be spent on the rural system. About half of this represents the backlog of needed work accumulated up to April, 1951. About $95,000,000 worth of work should be done on the 223-mile urban system—most of it as soon as possible.

As the report states, "Since modern highway standards have been developed through years of experience and research, departures from acknowledged good engineering practices are backward steps the limits of which are difficult to set." The emergency stop-gap measures that finally were defined are backward steps. They can give some relief temporarily, but only postpone complete correction. Such measures—to conserve critical materials—should not be used any longer than vitally necessary. The normal program of improve-

ment to fully justified normal design standards should be carried out whenever and wherever it can be done.

### Emergency Stop-gap Measures

It was determined that the stop-gap measures justified under emergency conditions should be designed to:

1. Permit traffic to move between main points at tolerable speeds.
2. Reduce transportation costs and accidents.
3. Preserve existing investments.
4. Fit as closely as possible into the ultimate normal improvement.

These emergency measures are different from the normal design in these ways:

*a.* Many stop-gaps are designed to the lower tolerable standards, if annual costs are less than for the longer-life ultimate design.

*b.* There is deliberate emphasis on "spot" corrections—dangerous curves, narrow bridges, and other unsafe conditions that can be remedied at moderate cost.

*c.* Where full design standards prove no more costly and are therefore used, the stop-gap program calls for only partial completion of the final design where this limited work will suffice for ten years.

*d.* The minimum mileage of improvement is planned. Short tolerable sections are omitted from the program, although normally they would be improved to obtain continuity of design.

*e.* Some intolerable features, such as moderately unsafe sight distance over crests of hills, are permitted to remain, provided the major deficiencies are corrected.

*f.* In cities, extensive use of re-routing, parking restrictions and minor betterments is planned.

In some cases, however, existing road or street conditions were so completely inadequate that stop-gaps either would not produce even tolerable conditions, or they could only be discarded when a fully adequate facility would be built. The answer was then to design to normal standards.

It was found possible to make reductions in costs and materials on 54 per cent of the intolerable mileage, but the remaining 46 per cent was planned for development to full modern standards even in the emergency period for two basic reasons:

1. The average yearly cost of the stop-gap over the ten years was equal to or greater than the normal improvement cost.

2. The stop-gap work was not a practicable nor feasible solution of intolerable conditions.

### Disadvantages of Stop-gap Program

In general, in the emergency program where stop-gap or stage construction work *was* economical and feasible, such work was planned for improvement only to bring the facility up to the tolerable limits established for traffic of the next ten years. Such emergency designs result in three conditions generally applicable to both rural and urban facilities:

1. Stage construction, only partially satisfying modern design requirements.

2. Continuation of many tolerable, but not modern, facilities.

3. Partial improvement, leaving a variety of sub-standard features.

Those conditions would be detrimental to highway transportation in these ways:

1. There would be more opportunities for accidents than exist on fully standard facilities.

2. Traffic congestion would occur more frequently than normal on roads of adequate design. Consequently, there would be greater delay to vehicle movement than would be anticipated normally.

3. Construction work on the existing roadways would often require more detours or delay than would normal improvements paralleling the existing route.

4. On roads built to or retained at tolerable standards there would be little or no reserve capacity, or "cushion" against more accidents and congestion under conditions producing sudden increases in travel above the conservative estimates used in the study.

It is clear then that the longer the emergency continues, the more it will seriously affect highway transportation.

One of the most significant results of the study indicated that some kind of work must be done on 95 per cent of the mileage currently intolerable. The conditions requiring correction in order to meet the objectives were found to be almost continuous over the entire length of roadway, or else the spot defects were so close to-

gether that spot corrections should be connected to provide continuity of design to meet safety requirements.

Nevertheless, it was found possible to reduce the normal rural program (for the backlog of existing needs) by 29 per cent in terms of overall cost. Structural steel, the principal item in short supply, could be reduced 24 per cent and reinforcing steel 43 per cent. These reductions were made possible by cutting out 174 miles of new construction and re-construction which normally would be done, and eliminating 64 bridges. The emergency program, however, would require 133 miles more of the less costly re-surfacing or widening to hold the roads temporarily in service.

About 92 tons of structural steel and 128 tons of reinforcing steel are needed on this rural system in Virginia for every million dollars of normal improvement cost, excluding rights of way. Emergency steel requirements are respectively 101 and 105 tons per million dollars of the lower cost for the emergency work.

As might be expected, the greatest relative reduction from normal in an emergency program is found on the facilities that are more nearly adequate. In the worst situations smaller savings are possible in relieving intolerable conditions, thus reflecting the need for complete new construction as the only feasible solution. The problems and expenses of such work are the principal reasons why it has not yet been accomplished.

The urban program contemplated maximum use of traffic engineering techniques to alleviate present capacity problems, but it was found that even the emergency objectives generally could not be reached without extensive physical improvements. Minimum requirements showed about the same reduction (29 per cent) from normal as found in the rural sections. It was possible, however, to make slightly greater reductions in steel requirements. Indicative of the urban needs is the fact that half of the total urban route mileage is under 40 feet wide, with 87 per cent below 48 feet, considered the minimum normal standard.

In considering the future ten-year requirements on roads and streets now tolerable (approximately two-thirds of the mileage), almost half would require improvement beyond normal mainte-

nance. To provide for increasing travel and to replace worn-out surfaces, the state should normally plan to reconstruct most of that mileage to bring it up to modern standards. Such reconstruction, of course, would salvage most of the existing facilities, making relatively minor corrections, strengthening the surfaces and widening the pavement and shoulders, together with adding lanes and bridges where necessary for traffic needs.

But the emergency requirements can be much less for the future ten-year needs than for the current backlog of intolerable sections. The major change here is simply to hold in service the existing roads by resurfacing. For this part of a total ten-year program, therefore, it would be possible to reduce the cost by 63 per cent and the steel requirements by 73 per cent, as compared to 29 per cent and 35 per cent respectively for the backlog needs.

Overall for the entire ten-year period, including minimum maintenance, the following summarizes the possible emergency reductions from a normal program:

42 per cent in costs of a rural program
29 per cent in costs of an urban program
40 per cent in rural structural steel
24 per cent in urban structural steel
55 per cent in rural reinforcing steel
49 per cent in urban reinforcing steel

Obviously, the needs of the next ten years to sustain transportation are of such proportion as to require a continuing major construction program. The size of the current backlog of needed improvements on inadequate and unsafe sections makes it clear that no lapse in activity can occur without costly consequences. It is also clear that it is impossible to effect these improvements over night on either a normal or emergency basis. Thus it is highly important for administrators to select those projects for annual programming which will contribute most to highway transportation with full consideration at the same time of material shortages and other factors that influence priority of work.

### Sufficiency Rating Standards

To aid a priority review and to assist in determining the relative adequacy of the routes under study, a special uniform rating system was set up. Each mile of the selected routes, both rural and urban, was measured by this "sufficiency rating" technique.

The sufficiency of the highway facilities was measured three ways: First, physical condition was rated according to the amount of pavement deterioration, cracking, roughness and cost of maintenance. Second, service of the facility was measured by analyzing its ability to carry present traffic volumes at reasonable speeds and without congestion. Third, safety features were rated, including width of lanes and shoulders, restrictions of passing opportunities, curves, clearances to bridge rails and other items. Accident records were used to locate most hazardous sections. "Par" values were assigned to each major element and item, with defined lesser values for those found sub-standard.

Each deviation from standard influenced the final score by varying amounts, depending on the importance of the item and how far it was sub-standard. Rules for measurement clearly set each value so that the study was made uniformly throughout the state.

The final rating for a road section pro-rates the actual scores as follows:

40 per cent to physical condition
30 per cent to road service (ability to carry traffic freely)
30 per cent to safety features

In cities, because of the greater importance of the "service" benefit, the pro-rating was:

20 per cent to physical condition
60 per cent to service
20 per cent to safety

The arbitrary nature of the values established does not answer the questions of what is or is not tolerable, although efforts were made to devise a plan that would produce reasonable correlation. It was found that 817 miles of the rural system rated below 70 (out

of 100) on the basis of the combination of factors. This corresponds roughly to the 841 miles found intolerable. The average combined rating for the entire rural system was 75, with an average rating of intolerable sections of 59. However, some of the mileage found intolerable rated above 70, principally because the rating techniques did not give sufficient weight to some of the factors which, if deficient, clearly require correction. Of the three major elements contained in the combined rating, that of "Safety" averaged 20 (out of 30) the lowest of the three element ratings. Only 103 rural miles of the 2,475 were found to be completely adequate, and 594 miles were less than 50 per cent adequate.

Values such as these for each individual project aided the priority analysis as an improved guide to engineering judgment of the relative merits. No formula can automatically select a priority schedule. In recommending priority of emergency work in Virginia, some factors of major importance were necessarily omitted, leaving these decisions entirely to administrative judgment. For example, no attempt was made to judge the relative merits of the rural system projects in relation to urban needs. The latter are of great importance, but in view of the varied ability of each city to finance them, a state-wide analysis of their urgency relative to rural needs or to each other would have little practical significance.

Neither was there any distinction made on the basis of functional importance between routes in the study system since all were broadly classed as principal traffic arteries of the state and as such were assumed to be of generally equal importance.

The priority program was confined to the backlog of emergency needs since it was considered these should take precedence over needs that would accrue in the future. However, it is well recognized that emergency conditions, such as structural failure, floods, etc., would require consideration of such work not included in the planned priority program.

For that work which was studied for priority listing, it is to be expected that a number of projects would be carried out within a year or two. Little is to be gained, therefore, in indicating any fine distinctions between the relative merits of individual projects. Within reasonable priority groupings there is often small choice of

one project over another. Therefore, the study indicated about one-third of the emergency backlog of needs as being most urgent. As conditions change, as emergency shortages are overcome and as the study is extended to other parts of the state highway system, the priority groupings will be revised.

Using the sufficiency rating as a tool, the emergency backlog projects were reviewed and set into priority groups through a series of steps. These gave first consideration to highways, streets and bridges in very poor structural condition. These are sections where work simply must be done very soon if complete failure of the travelled way is to be averted.

Since there are usually other inadequacies also, this group of projects was arranged in order of the combined sufficiency ratings which reflect the degree of overall adequacy. However, a few sections whose surface was at the point of failure were placed at the head of the list regardless of other considerations.

In a similar manner, the next group of projects selected covered the poorest sections from the standpoint of traffic capacity.

Placed next in order were those sections having an unusually low safety sufficiency rating and those having both structural condition and capacity below tolerable standards. These were also arranged in order of the combined ratings.

All remaining deficient highway sections were arranged in order of the combined sufficiency rating. Use of this rating for priority indication, of course, presupposes that it properly balances all physical elements affecting priority decisions. Since judgment assigned the values used, results must be reviewed with care to make certain they are in line with sound administrative and engineering experience and knowledge. Nevertheless, as previously stated, the method is useful if the following other considerations are applied:

1. Projects having higher traffic volumes than the average found on all sections where work is needed, were advanced approximately 20 per cent in the priority list established from the preceding analysis.

2. Wherever gaps in the consistency and continuity of route development still resulted, such work also was advanced about 20 per cent unless this had been done in the preceding step.

3. Consideration was given to geographic distribution of work among the various districts to provide for a reasonable balance of work load on avail-

able personnel and to provide for improvement of service in all parts of the state.

The preceding process makes it possible for highway administrators to review selections of programs with knowledge that all factors outlined have been uniformly taken into account on every location throughout the state.

Final decisions therefore can be narrowed to remaining considerations of overall feasibility which cannot be reflected in the techniques.

As the study of sufficiency rating techniques goes forward with further research into their application in the development of priority programs it is expected that other elements may be introduced, including benefit-cost ratio analysis and more definite means of apportioning work between rural and urban needs.

# Safeguarding School Crossings

DR. B. L. CORBETT

*Dr. Corbett has been Executive Director of the Milwaukee Safety Commission for twenty-five years. He was chairman of the Driver's Law Enforcement Committee of the Accident Prevention Conference, Department of Commerce, and from 1949 to 1952, vice-chairman of the Conference of Local Safety Organizations, National Safety Council. He served as president of the Association of Safety Council Executives, 1947–50 and is a member of the Board of Directors of the National Safety Council. He is also a member of the Highway Research Board, and of the Committee on Public Information of the President's Highway Safety Conference.*

EVERY community, regardless of its size, is concerned with the problem of providing protection for children in crossing streets on their way to and from school.

The police department in the average American city has been given the job of providing this protection, and has had to maneuver the working hours of its regular force. In some instances extra man power has been added, to cover the most important intersections during school-opening and closing hours.

The problem is never completely solved. The situation never quite becomes static. The police department never seems to have a large enough force to care for all requests from local officials, parents and Parent-Teacher Association groups as well as school officials.

Although Milwaukee's school child safety record has been excellent, the increasing number of automobiles and the alarming increase in traffic accidents demanded that additional protection be provided for the thousands of school children forced to cross these busy arteries.

Milwaukee has 173 elementary schools. Milwaukee school children cross 512 major street intersections to and from school. Eighty of these crossings are protected by automatic signals, 286 by school safety patrols only, and 110 by police officers assigned during assembly and dismissal periods.

With police work becoming more and more professionalized, and police training more extensive, each experienced policeman represents a large community investment.

Questions asked by the Milwaukee Safety Commission were, "Are the special skills of our highly trained policemen used most advantageously when they guard school crossings?" and "Are the admittedly high costs when police guard school crossings preventing the community from attaining the high measure of police protection for which our officers are trained?"

### Women School Crossing Guards

For these reasons the Milwaukee Safety Commission, after an extensive study of the problem, recommended the establishment of *women school crossing guards*. Qualifications were drafted. Suggested duties and a training program were outlined, and the commission was authorized by the common council to proceed with the hiring of seventy-five school crossing guards in the fall of 1949. The Milwaukee Civil Service Commission conducted the preliminary examination and seventy-five school crossing guards were hired. They were given an intensive one-week's training in the Milwaukee Police Training School and then assigned to the streets.

The Milwaukee school crossing guards are equipped with uniform caps, white Sam Brown belts, uniform overcoats, standard police badges and whistles. Assignments, as far as possible, were made to intersections nearest the school crossing guards' homes.

There was a good deal of comment from various sources to the effect that the first zero day would not find a school crossing guard on duty. The question was, "Can women efficiently take the place of veteran police officers in moving school children safely across heavily traveled streets?" "Can women stand on street corners in all kinds of weather?" The answer is "You bet they can!"

During the winter of 1950–51, Milwaukee school crossing guards reported for duty and remained on the job while the thermometer registered 24 degrees below zero. While most Milwaukee citizens spent every possible minute indoors to escape a record-breaking winter (twenty-one days of below zero weather compared

to the average of thirteen days), not one guard failed to report for duty because of sub-zero weather conditions.

The cooperation of the public was excellent, and it immediately became apparent the school crossing guard was here to stay.

If there is a traffic violation committed in the presence of a school crossing guard, the guard stops the motorist and issues a warning card. If the motorist fails to stop, the guard copies the license number and turns it in to the safety commission. The license number is then checked and a form letter is sent to the owner of the car, calling his attention to the violation reported and asking cooperation in protecting the lives of school children.

There have been some cases in Milwaukee where school crossing guards have noted some serious violations, hailed motorists to the curb, called for the regular police and accompanied police officers to headquarters where the school crossing guard swore out a warrant for the arrest of the violator. While such cases have been few, convictions have been 100 per cent.

It has been Milwaukee's experience that the woman school crossing guard has become the most practical and economical approach to the problem of adequately protecting school children since it provides excellent protection more economically than would be possible if regular police officers were assigned to this duty.

### Accolade from the Chief of Police

John W. Polcyn, chief of police in Milwaukee, in writing to the Common Council in July, 1950, declared:

"After careful observation of the conduct and work of the women so assigned for the period of March 27th, 1950, until the closing of the schools in June, it was apparent that they were doing an excellent job of safeguarding school children at street intersections near schools where children are obliged to cross the street at times when they come to or leave school.

"Many comments have been received respecting the work of these school crossing guards, both from city officials interested in the matter, and from private citizens, and on the whole it appears without doubt that the employment of the school crossing guard is definitely in the best interest of community welfare."

FIGURE 1. Subzero-weather uniforms designate and keep warm these 110 Milwaukee school-crossing guards.

FIGURE 2. A woman guard protects Milwaukee school children at a busy intersection.

The merits of the school crossing guard system have received city-wide recognition. Due to public demand the number of guards was increased to 100 by the Common Council in January, 1951.

According to Dr. B. L. Corbett, executive director of the Milwaukee Safety Commission, "If any city is facing the problem of getting children to and from school, that city should, by all means, try the most efficient and most *economical system,* namely school crossing guards. Women, if given a chance, will safeguard the youngsters, and at the same time, relieve the highly trained police officers for regular police duty."

School crossing guards will make your community a safer place in which to live.

## For School Crossing Guards

DR. B. L. CORBETT

*Suggested Qualifications*

1. Must be a citizen of the United States.

2. Must be a resident of the city of Milwaukee.

3. Must be in good physical condition—not less than 5' 2" in height, and shall not be heavier than 15 per cent above the standard weight recommended by the American Medical Association for the height and age of the applicant.

   a. Have no major physical defects.

   b. Good vision and hearing.

   c. Reasonably quick in reaction.

   d. Must be able to work outdoors in all types of weather for periods of time as established by the Milwaukee Safety Commission and the Milwaukee Police Department.

   e. Must take and pass a physical test yearly. Such physical test will include: heart, eyesight, hearing, applicant's blood pressure; symptoms of arthritis, hernia, etc.

4. Must have completed two years of high school education or the equivalent.

5. Must be of good character.

6. Must have a friendly personality toward children.

*Suggested Duties*

1. The duty of school crossing guards shall be to regulate and control pedestrian traffic at intersections in the vicinity of schools.

2. School crossing guards must report on duty at their assigned intersections from at least thirty minutes prior to the beginning of the morning and afternoon classes and remain on duty until 5 minutes following the scheduled starting time of these classes. They must also report at their assigned intersections at least 15 minutes prior to the earliest scheduled dismissal of both morning and afternoon classes and control pedestrian traffic at their assigned intersections until thirty minutes following the last scheduled class dismissal.

3. The school crossing guards must wear, at all times when on duty, a standard uniform as recommended by the Milwaukee Safety Commission.

4. In addition to the control of school children pedestrian traffic at their assigned intersections, the school crossing guards must also report on standard accident reporting forms all traffic accidents involving school children or others which occur in the vicinity of the school crossing at which they are assigned. They shall make out daily reports and such other reports as are requested from time to time by the Milwaukee Safety Commission.

5. They must satisfactorily complete the training program for school crossing guards conducted by the Milwaukee Safety Commission.

*Selection*

Candidates for school crossing guards are to be selected by the Milwaukee Safety Commission when openings occur. Employment will be provided for those persons whose ratings are the highest on the following factors:

1. Qualifications as previously listed.

2. Satisfactory completion of the training course. Special emphasis will be placed on:

   a. Adaptability to this type of work.
   b. Punctuality and regular attendance.
   c. Attentiveness to instructions.
   d. Sincerity of purpose.

*Training Program*

1. The training course to be conducted by the Milwaukee Safety Commission will consist of the following subjects:

   a. 6 hours – Traffic law.
   b. 2 hours – Rules and regulations governing operations of school crossing guards.

c. 3 hours – Operation of school safety patrols.

d. 3 hours – First aid.

14 hours – Total Classroom Instructions.

2. In addition to the above, the training course shall include four days of actual field training in small groups at selected intersections. The field training shall be conducted during the following hours:

8:30 a.m. to 9:15 a.m.
11:30 a.m. to 1:15 p.m.
3:00 p.m. to 4:00 p.m.

3. Recommendations:

A general meeting of the school crossing guards shall be held periodically, preferably on a Saturday morning, at least once each 60 days.

A meeting with all school crossing guards shall be held at one central location to discuss the program and answer any questions. At this meeting, uniforms shall be inspected and a traffic safety topic should be included.

*Assignment*

Determination of the need for school crossing guard protection at each school crossing in Milwaukee currently protected or requiring protection will be based on a study of conditions at the crossing. These conditions include:

1. Vehicular traffic volume.
2. Pedestrian traffic volume, including ages of school children.
3. Characteristics of the street:
   a. Width
   b. Existing traffic equipment
   c. Right angle crossing or otherwise
   d. Visibility
   e. Mass transportation stops
   f. Speed of traffic and gaps in traffic
   g. Past accident experience at the intersection
   h. Other reasons requiring the presence of additional protection.

It is the intention to assign school crossing guards to locations within reasonable walking distance of their residences, whenever possible. Whenever this is not possible, the school crossing guard may decide whether or not he or she wishes to accept the assignment at a location where transportation to or from his assigned school crossing is necessary. However, if the school crossing guard chooses to accept this assignment, he or she must comply in all respects to the duties previously listed. Under no conditions will any special allowance be made for traveling time to and from the assigned location.

*Supervisory Program for School Crossing Guard Personnel:*

The supervision of all school crossing guards shall be the responsibility of the Milwaukee Safety Commission.

School crossing guards unable to report for duty because of illness or other causes must telephone the station of that district in which they are assigned, at least twelve hours before the time of their assignments, so that temporary protection can be assigned to that crossing during the school crossing guard's absence.

**School Guard Report and Letter**

MILWAUKEE SCHOOL CROSSING GUARD
**AUTO VIOLATION REPORT**

Date_____ Time of Day_____
Street_____ Name of School_____
License No._____ Make of Auto_____
Violation_____
Witnesses_____
_____
Crossing Guard_____

SEND REPORT TO
Milwaukee Police Department — District Station

# CITY OF MILWAUKEE

SAFETY COMMISSION
A CHAPTER OF THE NATIONAL SAFETY COUNCIL

Room 101 — City Hall DALY 8-3711 — Milwaukee 2, Wisconsin

**Dear Sir:**

**It has been reported to this department that on __date__ at __time__ a.m., a car bearing license number_____ issued in your name, disregarded the direction of a School Crossing Guard at __location__ by __violation__.**

**School Crossing Guards have been instituted for the purpose of guarding the lives and safety of school children crossing streets going to and coming from school. If this program is to be successful it is absolutely necessary that motorists cooperate with Guards to the fullest extent.**

**May we further advise, that where School Crossing Guards are stationed constitutes a school crossing, and, under the law of the State of Wisconsin, that means a 15 mile per hour speed limit while children are going to and coming from school and while School**

Crossing Guards are on duty. Disregard of School guards and school zone signs may very easily result in the death of someone's child.

I am sure that you, as a safety-minded motorist, will cooperate for the protection of our children while they are crossing streets on their way to and from school by exercising greater caution in the future.

We wish to further advise that a record of this violation is kept in our file.

Yours very truly,

B. L. CORBETT,
Executive Director

BLC:f.

HELP KEEP MILWAUKEE AMERICA'S SAFEST CITY

## THE ENO FOUNDATION FOR HIGHWAY TRAFFIC CONTROL

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